

HOUSING PROBLEMS
IN
AMERICA

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HOUSING PROBLEMS IN AMERICA

PROCEEDINGS

OF THE

TENTH NATIONAL CONFERENCE
ON HOUSING

PHILADELPHIA

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PAPERS

THE STEEL-FRAME HOUSE ARRIVES

ROBERT TAPPAN

Architect

The American house is a complex machine, costing nearly three billions a year. It functions in an astonishing variety of ways. One hundred years ago it was a simple affair, serving merely as a shelter—hot in summer, cold in winter. The frontier settlers of the infant United States were content to live in homes that contained scarcely more conveniences than did the wooden hovels of three thousand years ago. Today we have no frontiers.

Though modest homes are now equipped with electricity, telephones, and washing machines, it is a curious fact that as the quality and quantity of household conveniences have increased, the structures that are designed to contain them are poorly planned, poorly built, distressing to look at, and vastly more expensive than were the simple, unpretentious homes of our forefathers.

Building materials cost more and are generally poorer in quality. Skilled labor, so-called, costs very much more. It is also poorer in quality. Plumbing, heating, and electrical devices are being constantly improved. These things are mechanically produced. But the hand-made small houses of today's craftsmen are shoddy by comparison.

The modern house building mechanic works from blue prints, more or less intelligently. His tools are mediæval in design. His mental attitude is worse than mediæval.

He resents change or improvement. He does not wish to have his work made easier, simpler or more convenient for him. He wants conditions to remain static. He is a standpatter!

Building material dealers stock cheap grades of lumber in their yards to-day that they would not allow there ten years ago. They must do so to meet cut-throat competition, or go out of the lumber business. Banks advance loans on cheap houses that they would not lend a penny on ten years ago. New wooden houses are offered for sale that have to be repainted if they are not disposed of within six months. Fifty per cent of the down payment on cheap houses goes into the pocket of the second mortgage shark, so that the speculative builder may continue his operations. Why? Because houses are hand made!

IF YOUR AUTOMOBILE WERE MADE IN YOUR BACKYARD

American hand-made articles are necessarily expensive. Labor is expensive and so is waste. Imagine a group of mechanics in your backyard trying to make an automobile, from strange plans and specifications. I claim that the whole housing problem hinges on the basic fact that houses are made by hand, and for this reason alone they cannot help but cost too much money. Hand labor is slow, wasteful, and experimental. Mistakes are inevitable and must be paid for by the ultimate consumer.

Before a new kitchen sink, radiator, or electric refrigerator is ready for the market, it is tried out and forced through every conceivable test. Finally, when every weakness has been discovered and when every possible refinement has been introduced, the new improved

product is ready for the market. It is unnecessary to compare this method of scientific manufacturing efficiency with the processes used to produce small houses.

It might be interesting to try to imagine what could happen to American homes if they were designed and manufactured by methods resembling the mass production of machinery. Many enthusiastic amateurs have attempted it with varying results. I cannot say that I know of many successful demonstrations. The very complexity—to say nothing of the novelty—of the idea seems to spread an opaque mantle of failure over every attempt to reduce small-house building to manufacturing terms.

I have spent more years than I care to remember trying to find an effective answer to the problem. My watchword has been: "Put the shell of the house on a par with its valuable equipment, and try if possible to lower house building costs so that even better equipment may be used."

For a long time I experimented with wooden houses made of standardized wall panels containing doors and windows installed complete at the factory, combined with ready-cut lumber. The scheme worked. During the Great War I had a chance to try this method out in a woodworking shop near Boston. We sold 6-room bungalows to the government erected complete for \$1950. But the armistice came before I entered the profiteer class.

Next I made some cottages for Serbia. They were fabricated in the Boston plant, photographed during different stages of erection, taken down, packed and shipped along with the pictures to Belgrade. The photographs served as a vivid description and specifi-

cation and the houses were erected without difficulty, 5,000 miles away from where they were made.

Then I went to Cuba and set up a large group of cottages on a sugar plantation. We lowered erection costs 80%, using native labor. When the sugar boom unexpectedly collapsed, I lost interest and money in unit houses and was forced to shelve the idea for a while.

Three years ago I set up a group of unit houses at Montauk, Long Island, and possibly as a result of this demonstration, was invited by the American Institute of Steel Construction to try out my ideas of unit design and shop fabrication with steel substituted for wood. The experience has been gratifying. In place of indifference and even hostility that I encountered from the lumber industry when experimenting with unit wooden houses, I met with the most delightful cooperation and made many pleasant contacts with steel producers in both America and Europe.

Practically all of the steel houses that had been attempted in this country were framed in imitation of wooden construction. This seemed hopelessly unscientific to me, so I determined to use steel, as steel; and gradually, without really intending it, I evolved a simple system of steel construction so novel that I have been able to patent it in this and several other countries.

Personally, I don't care a hoot about patents, but I find that business men and bankers are impressed by them, so now I slap a patent on to everything I think up.

UNIT CONSTRUCTION AND DESIGN

My steel houses are planned in multiples of 4 feet. Wooden houses are usually framed in multiples of 16 inches. Each steel member in my houses, therefore,

takes the place of three pieces of wood. Instead of rafters on sloping roofs, I use steel purlins that are interchangeable with the floor beams. I have little patience with the numerous trick light-weight steel members that are on the market. Broadly speaking, they cost more per pound and are not as economical, effective, or as satisfactory for my purposes as standard weight beams, channels, and angles.

My houses are constructed story by story, like a sectional bookcase. All supporting walls are one story high, with the floor beams fitted in between.

CHEAPER THAN FRAME

By this system the steel skeleton of an average small house may be erected complete at less cost than good, ordinary, wooden frame construction, and in much faster time, without employing skilled labor.

A few weeks ago I ordered a steel frame for a complicated little structure, 20 feet wide by 70 feet long, from the National Bridge Works in Long Island City. Before 5 working days elapsed, the steel was delivered by truck at East Hampton, Long Island, 120 miles away, and it was assembled and erected in the center of a huge sand dune by the boys from my office, as a lark, at a total cost of \$637.

The steel skeleton for a 2-story, 6-room house, 25 feet square, weighs but 8,000 pounds, or about two-thirds of a pound per cubic foot.

Its cost will vary with the local conditions. At Akron, Ohio, where my plant is located, it will cost less than \$350, completely assembled.

The walls, including the cellar if wanted, are made of 3-inch standard beams and channels used as posts,

spaced 4 feet apart and held together top and bottom by small twin steel angles bolted to them.

The purchaser of a Tappan Steel House is required merely to dig a hole in the ground and to install simple, reinforced concrete footings with anchor bolts sticking up at intervals to lock the cellar walls to the footings.

When the house arrives at the nearest railroad siding, he can easily truck the steel framework to the job, as it is shipped from the factory completely knocked down, and no piece weighs more than 250 pounds. At the building site, the skeleton walls are assembled with a monkey wrench and are then tipped up into place by man power. This method resembles an old fashioned barn raising.

THE FRAME WORK ERECTED IN 6 HOURS FOR \$25

The framework of this 6-room house can be assembled and erected by 4 unskilled workers in about 6 hours, or for less than \$25. The steel skeleton is braced and squared up with diagonal rods and turn buckles.

The next step is to enclose the house. Here my experience with the unit wooden houses proved helpful. I found that light-weight wall, roof, floor, and partition units could be manufactured of metal lath, welded to strip steel reinforcing angles, for about 8 cents a square foot, and that in quantity production, the cost will be even less. The window units contain steel sash electrically welded in place. The door units have openings to receive steel trimmed doors. All of the units are locked to the steel framework of the house by pounding over with a hammer the free legs of the reinforcing angles against the flanges of the adjoining beams or channels—about one day's work for 4 unskilled men.

These metal lath units take the place of the customary wood sheathing, furring, and metal lath that would be required on a wooden framed and stuccoed house. By their use, the entire skeleton may be enclosed with great speed and economy, as skilled labor is absolutely unnecessary. The units are of light weight but very strong, and form a perfect base for cement stucco or for reinforcement of the 2-inch waterproof cement cellar walls, floor, and roof slabs.

IN TWO DAYS' TIME THE HOUSE IS ERECTED AND ENCLOSED

So in 2 days' time the little house is substantially enclosed and the front door locked. The entire exterior, including the roof, is covered with Portland cement stucco. If a cement gun is available, this work can be done in about 2 hours. We did it in less time at Montauk, including a flash coat of colored cement. Next apply a 2-inch coat of concrete to the floor units.

While this work is going on, the installation of the shop-fabricated plumbing, electric wiring, and heating may be commenced.

It takes about 1 day to install the plumbing and heating systems. All supply piping is of brass or copper, cut properly to dimension at our plant, and threaded to receive the connecting unions.

The major part of the drainage system comes in one assembled unit; screwed connections being used throughout.

The ventilating chimney, by the way, is also made of steel. As the oil or gas burning hot water heating plant is located in the kitchen, a cellar is unnecessary. When I am able to substitute electrical heat, I'll part with the chimney as well as the cellar.

The minor partitions are insulated against sound, and the exterior walls and roofs against the passage of heat and cold, using, if desired, an available German compound of extremely high insulating value considerably superior to and somewhat cheaper than pressed cork board of the same thickness.

The stairs are of steel with rubber tile treads. They are installed along with the steel skeleton to save climbing up and down ladders.

After the electrical, plumbing, heating, and insulation equipment is in place, we are ready to install the interior wall, ceiling, and partition units. They are similar to the other units, only lighter in weight.

Next we apply the steel trim, baseboards, door frames, and radiator shields. This trim is all lacquered in the factory and is clipped readily to the steel wall units. The lacquered faces are protected by heavy paper, glued on.

Now we are ready for plaster, not the usual kind, but a plaster that sets in 48 hours so hard and tough and fire-resisting that it can hardly be compared with ordinary gypsum.

We have only the finished floors, roofing, and a few minor items left to do.

If wooden floors are desired, we use a new type of cellized oak flooring, glued to the reinforced concrete floor slab with a mastic cement. Or rubber tile and linoleum may be used.

Peel off the paper from the interior trim, set the glass in the windows, paint and decorate as you wish, and the house is ready to receive its steel furniture, consisting of kitchen cupboards, electric refrigerator, breakfast nook, linen closet, and wardrobe closets in the bedrooms.

Next hang the electric fixtures and move in.

I don't want people to think that all of this work is too simple and easy. There is an art in doing things, even in assembling factory-made units. But I have tried to explain sketchily the successive steps to take in erecting my standardized steel houses.

THE ADVANTAGES OF THE STEEL-FRAME HOUSE

What are the advantages? Some of them are as follows:

The first impression might be that all of my steel houses must look alike. Such is not the case. Thanks to unit design, an absolutely unlimited series of homes may be produced. Yet each individual building will have many interchangeable parts. No two human beings look exactly alike, yet we are all biologically related. If architectural designers followed this basic law of nature, we might be spared many curious creations.

I maintain that it is perfectly possible to standardize 75% of the essential parts of a small house and to produce them by modern mass-production methods. By varying the remaining 25%, no reasonable limits are denied the designer. This is a novel architectural theory, perhaps it is architectural treason, but if it is—the profession is welcome to make the most of it.

Vitruvius, the only ancient writer on architecture whose works have come down to us, states three qualities that are essential in fine buildings: stability, utility, beauty. The most important qualities of beauty are harmony, proportion, symmetry, ornament, and color.

Infinite variety, as we see it expressed on Main Street, is a modern invention of debased taste.

Harmonious unity was once an architectural virtue, when architectural designers were more familiar with building problems and less used to 6B pencils and tracing paper.

MASS PRODUCTION

By mass production, America has proved to the world that costs can be lowered astoundingly, but to my knowledge, nobody has yet ever seriously attempted to apply the principle of buying standardized building materials at factory prices for a completely manufactured house.

The ordinary big builder tries quantity buying and saves some money. But all along the line he is at the mercy of a chaotic and ridiculous system of merchandising. He must pay for the maker's distribution costs and advertising, as well as for his products. The steel house manufacturer, on the other hand, purchases his materials direct from the factory at factory prices, and sells his assembled house F. O. B. plant. There is an enormous difference between factory costs and retail prices, as the automobile industry has demonstrated. I have been told that Henry Ford buys tires at cost and that the tire manufacturer is glad to get his order.

Quick deliveries are possible. All the essential parts will be stocked at our plant in Akron and orders may be filled within 24 hours.

Rapid assembly means a saving in labor and overhead expense. Most mortgage loans are timed in accordance with the progress of the work. Usually the first installment is paid to the builder when his house is substantially enclosed. As my steel house can be enclosed in 2 days, nothing should prevent the builder from getting his money promptly.

NO LONGER DEPENDENT ON SKILLED LABOR

The practical elimination of skilled labor is entirely possible. Where labor unions are strongly entrenched, there might be trouble. I refuse to worry about it. Entrenched labor has always resisted change; has always fought economic progress; and has always finally adjusted itself to the inevitable. On the farm and in all outlying districts where skilled mechanics are scarce, the steel-framed house will find its first market.

Last July in Cleveland, a representative of mine was informed that the labor council would permit me to construct steel houses in Cleveland if I paid a very substantial cash penalty. I don't know what the money was to be used for, but it represented the labor union's estimate of the difference in cost between my methods and the ordinary building labor charges in that city. I thanked them for the unintentional compliment and moved my business to Akron, an open-shop town, 35 miles away.

AN INDESTRUCTIBLE HOUSE

The steel framed house is practically indestructible. It will not warp, shrink, rack, or rot. It is vermin, fire, and lightning proof. It cannot blow down.

The National Lumber Manufacturers Association in a pamphlet, issued recently for the private benefit of lumber salesmen, outlined some startling characteristics of wooden structures, as compared with steel. It asserted that more steel buildings than wooden buildings are destroyed by fire in American cities. It quoted an ex-weather bureau authority as stating that the cellar of a wooden house was the safest part of the house

to be in during a tornado, and used this statement as an endorsement for wooden construction! These and many other equally childish arguments were printed in an effort to discredit steel construction for homes.

Mr. Hoover, in his nomination speech last summer, emphasized the truth that we are not a nation of machines, but a nation of homes. As I travel around this country of ours, when the train pulls into some large city, I marvel that average, American workingmen and their wives can bring themselves to live in the disgraceful hovels that line both sides of the track, sometimes as far as the eye can see. I wonder why there is not more discontent with living conditions than appears on the surface.

And sometimes I wonder whether an attempt to provide better homes at lower cost for my fellow Americans isn't just as well worth an architect's while as designing and building cathedrals.

(For the Discussion of this Paper, see page 262.)

ABOLISHING THE DOMESTIC LOCK-STEP— THE SCIENTIFIC KITCHEN

HILDEGARDE KNEELAND

Bureau of Home Economics, U. S. Department of Agriculture

At such a Conference as this, concerned with the lofty problems of the Monster City, it takes considerable courage to introduce that most humble of topics—the domestic kitchen. But I find my support in so doing in the most potent of modern arguments—that of numerical magnitude. I am asking you to consider, not *the* kitchen, but twenty-six million (26,000,000) kitchens. I am claiming your attention for the workshops of the largest occupational group in the nation—a group so large that if it were listed in the Census of Occupations it would form one-third of our entire working population.

“Oh, yes, of course,” you may say, “as far as numbers go, housewives are important enough. But so little time is nowadays required for housekeeping that we need scarcely be concerned about the efficiency of their places of work. In this day of drug-store lunch counters, delicatessens, canned foods and baker’s bread, the domestic kitchen is rapidly becoming an obsolete institution. The space which it formerly occupied in the home is now usurped by the garage. And the time formerly spent over the stove is now spent over the bridge table.”

The argument is a familiar one—especially among those who are city-minded. And there is, of course,

much truth in it. One of the most striking changes of the last century is the passing of work from the home. We have been abolishing the domestic lock-step by abolishing the domestic industries. During recent years even that last bulwark of domesticity, the preparation of meals, has begun to fall before the attack of commercialized, large-scale industry. What the final outcome will be it is impossible to predict. But it is, of course, quite likely that the "scientific kitchen" of the future will serve not a single family but many families, that the advantages of large-scale production will in the end prevail against the advantages of private housekeeping.

But it is easy to over-estimate the speed with which this phase of the Industrial Revolution is taking place. The industries which have passed from the home are much in the public eye and interest. Those which remain are little seen and still less considered. They suffer a triple handicap:

In a world of change and novelty they are residual and familiar.

In a world still largely run by men they rest in the hands of women.

In a world of money values they fall outside of the price system.

Until recently, no one has considered the work of the household worthy of study. We have been content to dismiss it with a few noble phrases about Home and Mother and the easy assumption that as a producer the housewife is rapidly becoming as extinct as the dodo.

To what extent is this assumption justified? Of these twenty-six million housewives, how many still find in homemaking a full-time job? How many are still over-

worked? And how much of this time is spent in the kitchen?

In a study at the Bureau of Home Economics we have been seeking an answer to these questions. With the help of the Extension and Research staffs of several colleges, we have secured from over 2,000 homemakers careful daily records of how they spent their time for the seven days of a typical week. The returns have been surprising to those of us who by temperament are more observant of the changes taking place in the home than of the retention of old conditions. Only one-sixth of these homemakers spent less than 42 hours a week in their homemaking, one-half spent between 42 hours and 56 hours, and one-third 56 hours or more. The average for all was about 51 hours a week.

While no standard has yet been set for a reasonable working week for the homemaker, we should probably all agree on the 8-hour day, and should draw the line somewhere between the 42-hour week or five to five-and-a-half-day week of industry and a 56-hour or 7-day week. If we take this range as marking the limits of what might be considered a full-time job, just half of these women fall within this class, and of the remaining half, twice as many are overworked as are underworked. Clearly, if the occupation of homemaking is fading away, for these homemakers at least it still has some distance to go!

These figures cover only the time spent by the homemaker herself. When we include the help which she receives from her husband and children and from paid workers in the home, another 10 hours a day is added to the average, bringing the total time spent in homemaking to over 60 hours a week.

More than half of this time, moreover, was spent in the kitchen—in cooking, dishwashing and other food work, in washing, ironing and cleaning. The meals alone took over 21 hours a week, or 3 hours a day even in the city households; and in the farmhouses they required a full four hours a day.

We must remember, furthermore, that this time is spent on seven days of the week for fifty-two weeks of the year. We are dealing here with an industry that knows no slack seasons and depressions, and that seldom allows vacations or holidays.

THE WORKSHOP OF 12 MILLION WOMEN

In view of such figures as these, it is clear that the kitchen still remains our most important workshop. One thousand homemakers, of course, are only a small sample of the housewives of the nation. But sufficient evidence is at hand to suggest that for the 12,000,000 rural housewives these records are quite representative, at least for the middle class homes. For the town and city women the number of records is too small to warrant generalization. But even if a more extensive study of urban families would considerably lower these averages, the provision of meals alone would still rank as our largest single industry, employing the equivalent of as many full-time workers as all of the manufacturing industries together.

We should seem to be justified, therefore, in giving a little thought to the efficiency with which this work is carried on. We Americans are justly proud of the efficiency of our factories. Can we be equally so of our domestic workshops? The answer is only too obvious. The most that can be said for the household industries

is that we are at last becoming conscious of their inefficiency. We are challenged by the element of truth in the familiar saying that "while man works in the twentieth century, his wife keeps house in the sixteenth." And we are cherishing high hopes of bringing about a belated industrial revolution in the home.

By what means can this miracle be accomplished? Most of our effort so far has gone into educating the housewife. We are urging her to apply to her housekeeping the methods of management developed by "industry." We are seeking to make motion studies and time schedules as familiar household terms as calories and vitamins.

WE MUST BEGIN WITH THE ARCHITECT

Now all this, of course, is decidedly worth while. But as a sufficient means of increasing household efficiency it leaves much to be desired. In fact, we seem to have taken hold of the problem at the wrong end. Instead of trying to educate the housewife we should be devoting our first efforts to educating the architect and builder. And this for several reasons.

In the first place, the first essential of efficient production is not efficient management, but an efficient physical plant. If the workshop is too large, if the equipment is inadequate, if the arrangement of equipment requires constant retracing of steps, no amount of process charting and organizing of work can offset the waste of time and energy involved. That most of the kitchens now in use reveal all of these deficiencies needs no argument.

And the great majority of housewives must take their kitchens as they find them. For the 54% who rent, remodeling is usually out of the question. And even

for those who own their homes it is a costly and unsatisfactory makeshift. Any one who has had experience in making over kitchens will recall the distressing frequency with which the sink is in the wrong place, the stove needs to be moved and the doors and windows seem especially designed to interfere with efficient routing. If we are to have "scientific" kitchens we must build them so in the first place. If their number is markedly to increase, it must come from new construction. Something can be done, of course, in improving those now in existence, especially through the placing of portable equipment and shelves. But in a country in which housing becomes obsolete as rapidly as in ours, it is clearly the part of wisdom to let the patching up of old mistakes be decidedly secondary to the preventing of new ones. And if new mistakes are to be prevented, it is the architects and builders who must be converted, not the housewives.

The job of educating the architects and builders, moreover, is a much easier one. Compared with the 26,000,000 housewives, their numbers are encouragingly small. Only 90,000 builders and building contractors are listed by the 1920 Census. And of architects, the main objective of our campaign, there are a mere 18,000.

Furthermore, the average builder and architect is likely to prove more responsive to our efforts than the average housewife. For we are approaching him on his specialty, while for the housewife the housing of her family is only one of a most varied assortment of jobs. To a certain extent at least he has chosen his occupation because of interest and aptitude for it, while the housewife has usually adopted hers as a by-product of adopting the married state. And he carries on his work under

the stimulus of competition and contact with other workers and with the incentive of larger profits, while the housewife enjoys the doubtful benefits of the quiet and isolation of the home, the certainty of keeping her job and lack of concern for the money value of her efforts.

This is not to deny, of course, that there are many housewives whose ability in household engineering is equal to that of the best of architects and builders. Nor is it to imply that in carrying on our campaign we do not need their services. In fact, it is largely they, as representatives of the rank and file of homemakers, who must conduct the campaign. They, and those of us who are interested in their problems, must take the initiative in working out with the building industry the specifications for the "scientific" kitchen.

THE ESSENTIALS OF THE SCIENTIFIC KITCHEN

Just how will these kitchens, when we get them, differ from those which have been built for us in the past? What are the requirements of the efficient kitchen? It is needless to attempt a detailed description here; the information is readily available in numerous books and pamphlets. The main requirements may be summarized as:

First: The efficient kitchen requires a separate working surface for each kind of work to be done. In the preparation of meals this means a separate serving table as well as the usual work table or cabinet for mixing and preparing raw foods. And in the clearing away of meals, it means separate surfaces for stacking soiled dishes and for draining. There is no place in the

efficient kitchen for the general utility table, where mixing bowls and salad plates, soiled dishes and clean are jumbled together in hopeless confusion.

ARRANGEMENT IN STEP-SAVING SEQUENCE

Second: The efficient kitchen requires the arrangement of large equipment in a step-saving sequence. The briefest analysis of the work of the kitchen reveals a repeated order of work. We collect raw food, prepare it, cook it and serve it; we remove soiled dishes, scrape and stack them, wash, drain and put away. This obviously gives us the key to the placing of equipment on the floor-plan: for the preparing process, first the refrigerator and food cupboard, then the cabinet, then the stove and last the serving table; and for the clearing away process, first the stack table, then the sink, then the drain-board, and last the shelves for china and utensils.

In the preparing sequence, we can work either toward the right or the left, but we must end at the dining room door. In clearing away, however, we must always work toward the left—provided we are right handed. For each dish or utensil as it is washed is held in the left hand; and if the drain-board is on the right of the sink, we must cross the left hand over the right with every piece that we put down. The only place for a sink with a right hand drain-board is in the home of a left handed worker, or in a museum devoted to displaying the tangible evidences of human folly.

Third: The efficient kitchen requires a compact working area. This means the arrangement of large equipment along the walls in a nearly continuous working surface on either side of the dining room door, leaving just enough room in the center for the worker to move easily about. It means windows placed above the sink; and doors, closets and equipment not used in preparing and clearing away meals grouped at the other end of the kitchen. It usually also means an oblong kitchen, with only a few feet across from the cabinet to the sink, and a total floor space for the food work of not far from one hundred square feet.

EQUIPMENT AT CONVENIENT HEIGHTS

Fourth: The efficient kitchen requires the placing of equipment at convenient heights from the floor, so as to minimize as far as possible the necessity of stooping and stretching. This is, perhaps, our most difficult problem and one which calls for further study. For, there is no agreement as yet as to the most convenient height for even the average worker; and the height which is convenient for the short worker is, of course, too low for the tall one. Since we cannot standardize the height of housewives, we must find some way of making the height of our working surfaces adjustable. Meanwhile, with the average worker in mind, we can place the sink and the work tables several inches higher than they usually are now placed.

Fifth: The efficient kitchen requires the

grouping of small equipment around the working center where it is usually used first. This means the abolition of the general utility cupboard or closet and the building of shelves and other storage space in almost continuous series above and below the various working surfaces.

THEY MUST BE PART OF THE HOUSE WHEN BUILT

If these, then, are among the requirements of the "scientific" kitchen, to what extent can we expect the builder to meet them, and how far must their provision be left to the individual family? It is unquestionably desirable that the builder meet them all, that he equip the kitchen completely, with the refrigerator, cabinet, serving and stacking surfaces, and all facilities for storage, as well as the usual sink and stove. For, it is only through building in the equipment that it can be made fully efficient, as well as harmonious, attractive and easy to clean. And it is also only by building it in that its provision is assured. If the family must provide the missing units, they will all too frequently be lacking, or when provided fit badly into the space allowed. Can we not come to accept the full equipping of the kitchen as part of the costs of housing, just as we now accept the built-in closets in place of the portable wardrobes which used to disfigure our bedrooms? If it be claimed that this is too Utopian a scheme, then let us urge the builder at least to plan for all of the needed equipment, and to place his windows and doors, and the stove and sink which he does provide, according to this plan, so that the housewife bent on efficiency in her kitchen does not meet insuperable obstacles.

But even the 100%-efficient kitchen will not, of

course, suffice to bring the work of the household in line with our large scale industries. Even if the housewife is also 100%-efficient, the provision of meals in the home will still suffer the limitations of small-quantity production, lack of division of labor and inadequate machinery.

There is little reason why this should greatly concern us. If in the future we continue to prefer private house-keeping to its large-scale substitute, we shall be fully willing to pay the price, because it makes possible a way of living which seems to us more important than productive efficiency.

And if in the course of time we find ourselves turning more and more to quantity cooking, our present efforts in behalf of efficiency will not be wasted. We can apply the techniques of planning and building efficient domestic kitchens to the commercial or co-operative kitchens which supplant them.

(For the Discussion of this Paper, see page 283.)

HOMES EQUIPPED FOR CHILDREN

JAMES FORD

Executive Director, Better Homes in America

If we are to have social progress, children must be better endowed or better trained than their parents. This means that opportunities for good health and for physical, intellectual and moral growth must be superior to those enjoyed by their parents.

The criteria to be used in gauging the homes in which children grow up should be the same as those by which we test the school, the church or the settlement house or playground. Whether the purpose of the individual life is construed in terms of happiness, interest fulfillment or self realization, progressive achievement of life's purpose is dependent upon appreciation of values, free access to values, and active participation in the creation of values.

Life's highest values since Plato have usually been expressed as Truth, Beauty and Goodness—with subsequent Christian emphasis upon Goodness. Mediating and contributory values of Love, Freedom, breadth and depth of Self Expression, and Service inevitably command our greatest attention. One who has his eyes exclusively on the goal inevitably stumbles over some object in the foreground. The ultimate goal must, nevertheless, be known and viewed from time to time in order to get sense of direction; and then attention may safely and wisely be concentrated upon the objects which lie in the path just ahead.

THE HOME A TRAINING CENTER

With our goal in mind the function of the home is to serve as the initial and chief training center of human beings during the most impressionable years of their lives. Here they learn the often difficult lesson of accommodating their interests to those of others. Here chiefly they acquire those interests which dominate their lives. Here they may grow in wisdom, as well as in stature, and acquire an appreciation of life's values and receive their apprenticeship in the cultivation and creation or development of knowledge, of beauty, and of character.

The homes in which our future citizens are to grow up must first be judged with reference to standards of safety, healthfulness, convenience and comfort. An unsafe home cuts life short or handicaps the child's development. A home that is unsafe, or insanitary, or inconvenient, or uncomfortable, may produce such constant irritation that life's energy is focused chiefly upon annoying details rather than upon fundamentals. It is indispensable that parents as well as children should be relieved of needless irritations and drudgery. For, the attitudes of parents are imitated by or reflected in the life of the child and may preclude wholesome rounded development.

A PRIVATE DWELLING ESSENTIAL

The first essential is that every growing child should be able to grow up in a private dwelling, located in a convenient, quiet, attractive and wholesome neighborhood. No tenement or apartment, even in the so-called "model" class, can meet as well the deeper needs of

childhood—though it is admitted that such buildings may often be entirely adequate for families in which there are no children.

The reason for insisting upon a private dwelling, preferably detached, is that it can be made to provide sunshine and cross ventilation for every room, and thus a maximum of the life-giving forces which Nature affords. It also makes possible much more of privacy, independence and self expression than are afforded by the multiple dwelling.

It makes possible also a backyard for play, and space for a garden, which are among the fundamental requisites of early childhood. Home ownership further facilitates cooperative activity for common ends on the part of all members of the household, providing an apprenticeship in cooperative social living and in citizenship, which is almost always missed by the cave dwellers in the tenement or apartment districts of our cities.

Safety requirements of children involve adequate protection from fire and accident. In building a private dwelling sound construction and adequate fire stopping must be taken into consideration. Small children should not be obliged to sleep on a third floor which has only one means of egress. But assuming that the house is safe and built in conformity with the Veiller Model Housing Law, and that there is sound construction so that there will be no danger from falling ceilings, insecure railings and broken treads or boardings, there should still be certain additional requirements for the safety of children. These would include a low hand-rail on steep or winding stair-cases—such as may be found in old houses—a gate at the top of each flight of stairs where there are very young children, and screens around the radiators and fire places to prevent burning.

HEALTH NEEDS

To provide for the health needs of growing children their bedrooms and play rooms should be adequately sunned and easily aired. No house is wholly satisfactory which does not have double exposure for each room; for, otherwise, the air will become pocketed and stale. Sunshine is the cheapest and most effective germicide and fortunately reaches the floor, which is the area inhabited by the infant; dust is thus sterilized. But sunshine also contributes greatly to cheerfulness and to efficient metabolism and glowing health.

Children at all ages should also have the advantages of a sleeping porch or sun porch, and of a backyard in which to play. The health values of outdoor play are sufficiently obvious. Safety requires that the backyard should be fenced—at least until the children are of school age—unless many backyards are thrown together and a play director put in charge of the play activities of all children. The fenced backyard makes it possible for the mother, while engaged in her work in the kitchen, to supervise her children's out-of-doors play and choose their play associates. But the apartment house child is condemned to play altogether indoors or else to run the physical and social risk of playing on the street out of sight of its mother.

COMFORT AND CONVENIENCE

The health and safety of children have received more attention than their convenience and comfort. Our homes and furniture have been built for grown-ups rather than for children. To the infant who is just beginning to toddle, each room is a forest of table legs

and chair legs, with many tempting articles just beyond reach. His convenience and comfort are not provided for, unless there is a comfortable low chair, stool or hassock for his use in each room of the house.

In the dining room he is especially handicapped. Dr. John M. Gries in his admirable article on "Homes Equipped for Children" in the April, 1927, issue of the *Child Welfare Magazine*, writes graphically on this subject in the following words:

In the dining room it is undoubtedly preferable to have things high, especially drawer knobs and door handles. Some children never meddle, and others in the same family cannot be kept out of mischief. But just as they should have their small-sized rockers in the living room, so should they have dining chairs of the proper height.

In some families the children eat at a side table. This may be low with chairs to correspond, or it may be full height. In this case the problem is the same as if they sat at the table with the grownups. They too often graduate from the high-chair directly to a dining chair with the addition of a hassock, box, or dictionary to raise their eyes above the level of the table. But this is an awkward and inconvenient arrangement, and long before the child is large enough, he is using the same height chair that his parents use.

From that time until he is grown, he is told at every meal that his table manners grow worse every day, and that he eats worse than he did when he was a baby. This may be true. A man or woman who can conduct a spoonful of soup or eat meat from a plate on a level with his or her chin, and not look like a cartoon might be qualified to criticise a child's awkwardness. Poor table manners are often directly traceable to low chairs, while knives, forks, spoons and tumblers too large for small hands come in for their share.

There are many other things we should do for the child's comfort, and for the parents' as well. A hall closet, which can be reached without going through any room, is indispensable for outdoor things. A colleague of mine has a rather large family; to take care of the problem of overshoes, he built a box in his closet with a compartment for the overshoes of each child and with the child's name properly attached on top of his own special cover. The bottom of that box was so designed that it could be removed, making it possible to clean it out periodically; for the overshoes were usually muddy when thrown into the box.

There are many expedients of that sort which are useful and save an immense amount of time and worry and, perhaps, quarreling. Low hooks are also important, otherwise the child will jump for his coat and probably break the hanger and perhaps tear the coat, or will throw it down on a chair or on the floor rather than hang it up, if the hook is not within reach.

There are other inconveniences; bathroom and kitchen fixtures are too high for small children. A movable box seems to be the only expedient—unless one can afford to put in a special bathroom for children or a special place for children to wash in the kitchen—a box so constructed that it will be safe for the child and can be easily put out of the way while the child is at school.

A PLACE FOR PLAY AND PLAYTHINGS

The next desideratum is an adequate place in which to play and to keep one's prized possessions. When parents say that children are always underfoot, it is usually because no adequate provision has been made for this fundamental need of childhood.

Play is a child's chief means of experiencing life at its best and of training for adult living through experimental verification of life's values. The best of play gives scope to imagination, develops independence and resourcefulness, and ability to do an ever-increasing number of things and do them well. It is important that such constructive opportunities should not needlessly be interfered with.

This means that the battalion of tin soldiers, or the sand village or the electric train, must not be torn up every night; but allowed, within reason, to be ever expanding projects, until abandoned from lack of interest. This rule is consistent with orderliness—which can be taught simultaneously—but with a minimum of interruption of the project. Low drawers and cupboards within the child's reach are essential to store away all toys with which he has finished; and, of course, such drawers must be so designed that they may be opened easily and closed by the child himself. If the family cannot afford a playroom, a corner of some other room may be consecrated to this use. This playroom for growing children may be converted into a study when they reach high school age.

A WORKSHOP ESSENTIAL

Another essential is a workshop where there can be a work bench and shelves and an adequate assortment of tools to construct all sorts of things in which the boy—or tom-boy girl—delights. That workshop should be either in the basement or attic in the city home. In the country there are sheds and barns which can be used, but the city boy is not so privileged. If it is in the basement, it should be well sunned and dry. Here the son

will serve an apprenticeship to his father; or, rather, they will work cooperatively in the pursuit of a common interest—a vastly important thing. For, since the passing of the guild system—ever since the industrial revolution—the boy has been deprived of an opportunity of association with the father in his work. And in the present generation the daughter may be deprived of association with her mother in the housework of the family—due to the ever increasing cramping of the kitchen and the multiplication of outside interests for the child.

In addition to the workshop, there should be the girl's sewing corner, or corner where she can keep her doll nursery when she is quite young. Studio equipment for drawing or painting is also essential. Low bookshelves which will hold the oversized books of the small child are also desirable, as such books can seldom be accommodated in the family library.

ATTIC JOYS

Of course, an open attic is the delight of any child's heart and makes possible more extensive play operations than any ordinary playroom would afford. The rural child is still more blessed because the sheds, barns and stables each add to the scope and fun of his play. But, unfortunately, in this generation many children have to be deprived of the joys of living in the country—at least during nine months of the year.

If we paid more attention to the most fundamental of all housing problems, that of industrial and residential decentralization, we would have much more opportunity for providing these essentials for children. No problem in the entire field is so important, to my

mind, as that of persuading industries to move out of our cities and of building suitable residences in Garden Suburbs nearby.

The single-family suburban house makes possible a backyard and garage which will partly take care of these fundamental needs of children. The backyard can provide for all ages—from the youngest to the eldest—and its equipment may range from the sand box of the younger children to the targets for archery or the basket ball cages supplied for those who are older. Swings, seesaws, horizontal bars, standards for high jumping and apparatus for bean bags, quoits, clock golf or croquet can be provided in a relatively small space.

The book entitled "Home Play," issued by the Playground and Recreation Association of America, shows how the equipment for both indoor and outdoor play can be made at home at minimum cost. During Better Homes Week of 1928, the Better Homes Committee of Erie County, in cooperation with the Recreation Division of the City Planning Commission of Buffalo, arranged for a demonstration of home playground equipment made in the homes of the city and also showed such equipment in use. Similar demonstrations have been conducted in scores of other cities during Better Homes Week through the cooperation of public recreation departments with local Better Homes committees.

THE NEEDS OF THE SPIRIT

The more fundamental needs of childhood—safety and health and convenience and comfort—have been examined. These are vastly important and the basis

on which our superstructure must be built. But the child must also have continuous access to Truth and Beauty and Goodness.

There should be opportunity for close association of children with their parents. Every home needs a library—not just one book, as a friend of mine found in a house which he rented, furnished, in Washington. Original drawing and painting should be encouraged on the part of children at all ages.

As for goodness, it is everywhere within reach; but the family should recognize the need of providing “temptations to be good.” A settlement worker once inquired of me, “Why is it that the bad is so interesting and the good so uninteresting?” It is because the good has been wrongly presented. Cooperative activities on the part of the parents and children will give them an opportunity to know each other very much better and to share their interests, their knowledge and their wisdom.

One of the chief essentials for development, in both wisdom and goodness, is privacy. Every child should have a room of its own. Though serious harm may not be done by having the sons of the household sleep in one room, and the daughters in another, when those rooms have adequate ventilation—the practice, however, is likely to interfere with sleep—which is one of the essential factors in the production of good health. A restless child will keep its roommate awake and the one who retires last or rises first may cut short the other’s sleep. This is perhaps less serious in the case of the congregate sleeping porch because sleep there is more sound and the conditions are much more favorable to health.

PRIVACY DESIRABLE

Wherever possible the child should have a room of its own where it can work and play without interruption. Independence, resourcefulness, and individuality are essential for most effective living, but their development is interfered with seriously by the necessity of enduring frequent interruptions.

The need for privacy becomes still more apparent when the child reaches the age when it must bring home lessons from school. The concentration which is essential to success in intellectual pursuits can be developed by some in spite of confusion and interruption, but, probably, all children would be better off if they could do their lessons in complete privacy.

It is erroneously assumed that education and schooling are synonymous. But if children are to be trained to an efficiency greater than that of their parents—and we certainly would not wish them to be held back to our own levels of so-called efficiency—they must have opportunity not only to solve their school problems in privacy, but also to read widely, to make things, to paint or sketch; and, wherever such Oriental values are possible in this crowded materialistic civilization of ours—to meditate.

Many a child probably misses life's deepest spiritual values because of the fact that it has no opportunity for intimate discussion of the deeper spiritual and moral problems of life with either parent except when other children are around—"listening in." The deepest moments of life are inevitably solitary and the child that does not have privacy may develop into a stereotyped adult personality, crowd-minded, uninteresting

and devoid of the attributes which make for moral leadership.

THE HOME AS A BUILDER OF CHARACTER

Homes equipped for children must therefore provide the equipment and facilities which make for safety, health, convenience and comfort. Comfort and convenience must be construed in terms of the child's age, size and interests.

But if we aim to develop all innate capacities in our future citizens and to give each one the opportunity to develop all of his given latent abilities, we must not be content with mere health and comfort; but must provide conditions favorable for intellectual, moral and spiritual growth.

Character is set by home conditions. Few are able to surmount such conditions. Practically all of the impressions of the first six years of life come from the home; and, in the subsequent years, from one-third to one-half of the life of the child is spent in the home environment. Moreover, the child is in that environment during the most impressionable hours of the day, namely, the early morning and late evening.

Unless therefore it has privacy and is surrounded with opportunity for self-development, it will never develop broad interests, the habit of working things out to their logical conclusion, resourcefulness, or depth of inner life. But if provided with the environment which we have outlined and with wise parents, creative living becomes possible.

(For the Discussion of this Paper, see page 290.)

WHAT THE REST OF THE COUNTRY CAN LEARN FROM PHILADELPHIA

BERNARD J. NEWMAN

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Deems Taylor in his satirical thunder against New York's drift toward self strangulation sees no stay in its suicidal mania until her builders come to realize that "trespassing on another man's air is as bad as trespassing on his land." This trend is not conspicuous in Philadelphia. Except for a few money grabbers who are erecting skyscrapers in the central city, Philadelphia builders are not trespassing on other men's air.

Housing in Philadelphia for almost 300 years has disregarded the Tower of Babel prototype of living and has spread over the land. We keep our feet on the ground, neither burrow underneath, nor wall ourselves away from the sunlight in gloomy rooms, nor aspire to the realms of the smokestacks. Mistakes have been made in the allotment of yard areas, but these have been checked. The lure of perpendicular heights has not been generally felt. Over 80% of our families live in single dwellings; and, although some families today are a little too susceptible to the call of the apartment house, yet, we still continue to erect small houses and strive to bring them down to the economic reach of the average family budget—exalting the ideal of the individual home, with its privacy, sunlight and ventilation.

Even though the tall apartments in the last two years' programme have supplied 30% of the total

new family accommodations, they are not attracting our population. Speculative builders sponsor them, many of whom go broke. Owners have difficulty in selling them, padding their leases with rents in excess of the actual rates in order to show a return that will help to secure high mortgages and attract gullible investors. Philadelphians, not accustomed to apartment life, find the breaking of "the domestic lockstep," advertised as the attraction of apartment living, an inadequate compensation for the noise of herded householders, the flare of radios, the neighbors "making whoopee," which in the reverberating echoes of the walled-in courts, make long nights the despair of the tired and sleepy. They are moving out again into small homes. Philadelphia has not as yet gone up in the air to house the major part of its population. In no one year in its history has it erected as many as 100 buildings of this type. It still adheres to the small dwelling as the mode in its housing.

A CITY OF SMALL HOMES

Perhaps this may best be illustrated in a comparative statement of housing types. The City Assessors' list for 1928 credits Philadelphia with 415,045 buildings of all kinds—used in whole or in part for human habitation. The Division of Housing and Sanitation has a record of 9654 multiple-houses listed. This figure is probably incomplete, but there are still over 400,000 one-family dwellings in Philadelphia. The converted dwelling type of tenement is rarely over 3 stories high and does not average over 5 families per building, so that even in such type of occupancy Philadelphia has not accepted the barrack-like structure so common in tenement cities.

During the past 6 years the dwelling construction programme within the city has recorded 57,202 houses under construction permit, of which only 490 were tenements and 413, 2-family houses. The total family accommodations provided for was 69,953; of which 12,828 were in multiple-buildings, or 18.3% of the total.

It is apparent that Philadelphia demonstrates the practicality of the one-family dwelling, even in a city of over 2,000,000 population. It would seem reasonable to conclude that in [cities of similar topography, there is no compelling necessity arising from urban living to force families to house themselves in cliff-like structures. This is lesson number one and is based on the good old formula that what *has* been done can be done again. It is not a theory that confronts us but a demonstrated fact.

Now let us turn to lesson number two. Of the 69,953 family accommodations provided during the past 6 years, only 1211 were in frame structures. The remainder were in brick and stone. Out of the 415,045 dwellings in the city in 1928, only 9248 were made of wood. A wooden building over 3 stories cannot legally be occupied as a tenement within city limits nor can a wooden building of any size be occupied as a tenement within the fire limit zone. Hence Philadelphia construction is fire-resisting. That it pays is shown in the relatively low fire loss per capita, which in 1927 was \$2.08 as compared with \$2.37 in Cleveland; \$3.30 in New York; \$3.42 in Pittsburgh, \$3.51 in Buffalo; \$4.28 in Detroit; \$4.39 in Chicago and \$4.95 in Boston.

Lesson number two may well be stated in the language of such construction. A large city can taboo frame buildings from its annual quota of new housing,

and it can prohibit the use of such buildings for multiple type of occupancy, and by so doing reduce its fire hazards and lower its fire losses.

HOMES WITHIN THE MEANS OF WORKINGMEN

But what about the sales price of such new construction? Shall we call this lesson number three? We use the question mark here, because comparable facts are not available for the rest of the country. There are so many factors that enter into a comparison of sales prices, that the mere statement of the price the home buyer has to pay for his dwelling is not sufficiently informative to justify a comparison.

The reception given by the housing workers in other cities to the statement of sales prices in this city, has led us to believe that the comparison is not to the disadvantage of Philadelphia builders. The home seeker in Philadelphia whose annual income is \$1800 and over can find a wide choice of well equipped newly built houses of attractive layout at sales prices beginning as low as \$4000, or \$800 per room. The lowest priced houses built in any considerable sized operation last year are being marketed at \$3990. They are sold on a cash payment of \$490 with a monthly carrying charge of \$30.40 (a dollar a day), of which \$5 is credited to the amortization of the second mortgage. These brick dwellings are 14 ft. 8 inches by 26 ft., built on lots 75 ft. in depth, with set-backs of 15 ft. from the street line. They contain 5 rooms, have hot water heating, gas range, electric fixtures, floor plugs, standard plumbing, hardwood floors, twin cement porches, and guaranteed roofing and are within walking distance of 20 industries.

In a higher priced home of \$5100 the home buyer

may secure 6 rooms in a house 16 ft. 6 inches by 36 ft., on a lot 16 ft. 8 inches by 70 ft. Such a home has attractions which a few years ago could not be found in dwellings costing several thousand dollars more in price. It has hardwood floors in all rooms except the kitchen, breakfast room and bathroom, which have instead inlaid linoleum, cemented on felt. Moreover, it has tiled bathroom, built-in tub and shower, standard plumbing fixtures with apron front sink, hot water heater, electric fixtures, large closets, heated basement, garage, cement open plaza, deep terrace and shrubbery and other devices and attractions to help make a comfortable home.

The monthly cost to the purchaser will not exceed \$39.10, of which \$7.50 will be for amortization. For \$300 more the buyer may have all these and other attractions, including kitchen-cabinet, shades, cabinet gas-range, electric refrigerator, plate-glass caulked windows, copper spouting and enclosed porch. His living room will be 18 ft. 9 inches by 14 ft. 8 inches, in a house financed on a plan that requires a \$690 cash payment, with net carrying charges of \$34.17 per month, exclusive of \$8 a month for amortization.

Stepping up \$800 more in price—or slightly over \$1000 per room—the family with \$3000 annual income may purchase a house 16 ft. by 54 ft. on a lot 16 ft. by 110 ft. and have, in addition to the foregoing improvements, plate mirrored doors in bed rooms, a separate stall shower, extra toilet room, linen and cedar closets, electric hair dryers, furnished breakfast nook, separate refrigerator room, electric fire place, a double garage, terraced lawn and shrubbery and 114 feet between the rear house walls on opposite abutting lots. All for a

cash payment of \$890 and a monthly carrying charge of \$39.20 and \$9 monthly building and loan dues.

It is possible in Philadelphia today for home buyers, in the income ranges of \$25 to \$40 a week, to secure modern attractive well built dwellings, equipped to relieve household drudgery, replete with the conveniences and frills that delight the average housewife, and located in areas within easy reach of car lines to the commercial and industrial centers of the city.

The city planner may take exception to the grid-iron plan according to which these home areas are laid out. Philadelphia is weak in many phases of its planning. It is noticeable, however, that most of the new construction is getting away from the minimum yard area so characteristic of a decade or two ago. Thus, for example, the lowest priced new houses of today cover only 37% of the lot and average 28 houses per acre, while the \$6200 type are built only 19 per acre—a number in excess of the ideal toward which city planners are working, but a commendable figure when erected on urban land subject to urban land prices. Philadelphia's current construction is a challenge to those cities which supinely accept building practices and financing methods demonstrated by the experience here to be faulty, that lead them into housing types conducive to land overcrowding and congested occupancy.

SALES PRICES GETTING LOWER

Moreover, it is worthy of note in passing that sales prices of Philadelphia's new housing have been steadily declining during the past half decade. The annual informative surveys of the Philadelphia Housing Association on new dwelling construction for a period of 5

years show a drop in average sales price from \$8465 in 1924 to \$6550 in 1928, with the average construction cost reduced from \$5400 in 1924 to \$4300 in 1928. In the survey of 1924 it was noted that 42% of the new construction on the market was in a price range of over \$8000. In each subsequent year the percentage has dropped as follows: 33.7% in 25; 19.3% in 26; 15.4% in 27; and last year the percentage was 6.3. Correspondingly, there was an increase in the percentage of houses erected for \$6000 or less. Beginning in 1924 with 15.4% of the total construction, it ran successively 19.9%, 14.0%, 26.1%—and last year 35.4%.

When the National Housing Conference was held in Philadelphia in 1923, one of the leading operative builders boldly prophesied that the day had passed when dwellings could be erected to sell for less than \$7500. It is dangerous to prophesy. For, today 5.3% of the completed construction of 1928 is being sold for \$5000 or less, and 75% for \$7000 or less.

There is a further demonstrable fact which has been brought out by these yearly surveys. That is, that, as the sales price decreases by \$1000 units in each year's construction, the percentage of absorption increases. It is undoubtedly true that these surveys have brought home to the builders and their financial backers the business values in lowering sales prices to meet the larger market found—none the less in Philadelphia than in all cities—among income groups in the lower ranges. The philanthropic urge for low-cost housing felt by many of the more intelligent civic minded citizens which drives them to agitate for government-aid in this field will not yield the results they seek nearly so quickly as will a demonstration of the business sagacity of catering to the largest market.

It is only through education of the builder and his financial backers to the greater profits in lower sales prices that the stimulus to inventive genius is given which results in lower construction costs. Delayed absorption, with its attendant losses, may be due to one or more causes—but it is a good teacher. And when it is primarily due to an attempt to market a product beyond the reach of the prospective buyers, it compels attention, and forces a reorganization of methods previously practiced and a lowering of costs. But if the economic pressure is disturbed by subsidies, the whole economic order is changed and the resultant conditions in the housing field are more deplorable than they were before.

Of course I would not have you believe dwelling sales prices are as low as they should be or can be in Philadelphia. But they are low when compared with prices in other large cities. There are many causes working to help them to keep low here. The sales price of a dwelling is governed by 4 major factors: financing charges, land costs, construction costs and the builder's profit.

FINANCING THE HOME BUYER THE SECRET

In the practices common to Philadelphia as they are affected by the first three factors, there may be found the substance of the fourth lesson this city has to teach in the dwelling field. Perhaps most significant is the financing procedure adopted here. I do not refer to the method of financing builders but of financing *buyers*. In the financing of builders emphasis would be on how not to do it; for, financing costs are excessively high in a large percentage of cases.

It is in financing the home buyer that economies are

effected which tend to lower costs. Philadelphia is the home of the Building and Loan Association. It has today about 3500 such Associations. They are the great savings funds of the average citizen, as they also are the great loan organizations for the aid of the home buyer. Unlike the practice elsewhere, many of these local Associations grant loans on second mortgages. Trust company funds are used for first mortgages.

The home buyer pays from 10 to 20% cash and the balance in a Building and Loan mortgage, which is amortized in about 11 years. The monthly payment, which is slightly lower than the rent rate for a similar dwelling, takes care of the interest, and credits a sum for such amortization, which sum earns interest while it is accumulating, varying from $7\frac{1}{2}$ to 10%. Many builders sell their houses at a lower cash payment, taking back a note which is the equivalent of a third mortgage.

It is this easy financing plan for the home buyer that makes the market for the operative builder. It is only a question of production to meet the demand. There will always be producers, if there are potential buyers. As the market is slow in the higher priced ranges, sales are less frequent; the builder adjusts his construction to a lower range, and provides accordingly. This competition between builders brings a lower cost house. The crux of the situation is the movement of houses, which movement the easy plan of the Building and Loan Association facilitates.

Philadelphia has more such Associations than any other city in the country. A natural consequence of this situation is the mass production of dwellings, each unit of which may be sold under a separate agreement,

the buyer being given title to his holdings without co-operative responsibility for upkeep, taxes and like costs attendant upon ownership in cooperative apartments. In mass production there are saving possibilities that tend to lower the sales price of dwellings. Dwelling production becomes a manufacturing proposition. Many Philadelphia builders have perfected their operations under such a plan so as to effect savings in the purchase or production of materials and in financing construction costs.

There are other factors which have contributed to the relative low sales price of local housing, as compared with the two other large cities of Chicago and New York. We have here an excellent transit situation, largely created by the fan-like spread of our commuting steam and electric railroads, which in the past opened up, in connection with through traffic service, commuting stations in virgin territory. Until recently our street car service has been widely extended, making it possible for builders to open land for housing development. We have gone ahead in transit expansion and surface and undersurface utilities to help ripen new areas for the operative builders, so that land values until recently have been distributed and not concentrated.

There are Philadelphians today who would change this long rooted policy and curtail transit extension in the interest of concentrated land values, with all its costly consequences to home life in congested use and occupancy, but it is a passing challenge which Philadelphia will successfully meet. Transit extension has helped Philadelphia to spread out and has contributed its share to making this a city of homes, has bred in Philadelphians the conviction that they are entitled

to a home and not simply to a cross-section of an ant hill.

Again, the city has been favored with many natural industrial districts toward which industry has gravitated. Located in areas far apart, industry has helped to develop surrounding areas into home sites for industrial workers—again aiding the distribution of the population, and, unconsciously, thwarting concentration. The only area where this influence has not been felt has become over-developed through limitation of its geographical boundaries in the days prior to consolidation. This area, is now the “blighted district” of the greater city.

THE SMALL SIZED LOT A BIG FACTOR

But perhaps the most influential factor in the distribution of the population of the city has been the municipal regulation of lot sizes. Establishing as a standard the minimum frontage of 14 feet per lot, it has created the small lot as the prevailing practice—only recently deviated from in response to demand for a new style of housing, characterized as the “daylight” house, two rooms deep and 16 feet to 18 feet in width. By thus encouraging the small lot, lot values are kept within the standard ratio dwelling-cost of land value to construction cost as of 1 to 5.

Manifestly, if the standard lot were of the 25-foot or 50-foot frontage established by practice or law in many cities, the building value thereof would be commensurately higher, and the structure erected thereon, in order to be economically successful, would have to house more than one family. By permitting the 14-foot frontage, the owners’ land investment per building is

lower and the cost of the building erected is likewise lower. Whether this is necessary or not, it has been a large factor in building up Philadelphia as a city of small homes. The continuance of such subdivision is stimulating the continuance of the practice of spreading the population. The inroad of the tenement type in the past five years has been partly due to increase in land values in consequence of a short sighted transit development programme, which furnished fast transit for a small area without feeder lines beyond, and which does not keep pace, therefore, with population needs. But this, as previously stated, is creating its own agitation for correction.

Philadelphia housing in the lower priced ranges is largely of the row type. There are those who object to this—who point out the monotony of the skyline and facetiously ask how a Philadelphian recognizes his own door step. Artistic expression is a glorious ideal, but art is costly. If to get art, we must add costs to the construction of dwellings that force up sales prices beyond the reach of the average wage earner, we are not contributing to the solution of the problem confronting every city and town in the land. We are forcing even the average earner to utilize the cast-off housing of the more affluent among our population.

It is not art, however, that is found in the tenement cities. It is only a higher skyline and five flights of stairs to reach it. The low-built house, two rooms deep, with its wide space of street and set-back between opposite facades, and its equally wide areas between the rear walls of opposite buildings, means light and air, privacy and home ownership, with the sense of the owner's castle for the family that occupies it. This is

the type that lends itself to mass production and to lower rental and purchase rates and gives the promise of sanitary equipment and hygienic occupancy. Until this goal is attained for all our population, we can bear with good grace its manifest shortcomings from the æsthetic ideal.

IS GOVERNMENT-AID NECESSARY IN HOUSE FINANCING?

EDITH ELMER WOOD

Author

Is government-aid necessary in house financing? The answer is "Yes." I propose to point out in what sense and why. But first let us define our terms.

"Government" means any public authority—national, state or local. "Aid" means anything that helps—by no means necessarily a subsidy. The erroneous impression that government-aid is equivalent to government-subsidy is at the root of most of the emotional hostility to government-aid to housing in the United States today.

The pamphlet "How to Own Your Home" issued by the Housing Division of the U. S. Department of Commerce is very truly a government-aid in house financing. So, in a different way, is a zoning ordinance which checks speculative increase in the cost of land. The state laws which regulate and supervise Building and Loan Associations are definitely a government-aid in house financing. Granting that such kinds of government-aid are not what I was asked to discuss, my point is that they grade insensibly into the other type.

The sort of supervision at present exercised by the New York State Board of Housing over limited-dividend and co-operative companies which receive its approval is, on the one hand, a definite help to inexperi-

enced groups in managing their enterprises wisely; and, on the other, makes it possible for them to obtain first mortgage loans—and sometimes second—at low interest rates. Thus, the Metropolitan Life Insurance Company is making first mortgage loans at 5% to the companies approved and supervised by the State Housing Board because of that approval and supervision. Official approval and supervision always play an important part in European housing loans.

One of the tragedies of our *laissez-faire* system is the way in which those with least business experience and least able to afford financial loss, are exposed to exploitation by unscrupulous promoters, because there is no one to warn them from a jerry-built house, an unsuitable location, an impending assessment, or a trickily worded contract. An official bureau for disinterested expert advice to prospective home buyers would be a boon to thousands of families.

NOT A SUBSIDY

In 1920 and succeeding years, the Calder-Nolan Building Loan Bank bill was before Congress and came measurably near to passing. It had the cordial approval of the Building and Loan Societies and apparently of the National Housing Association. Its purpose was to increase the lending funds at the disposal of the Building and Loan Associations. This would have been an aid in house financing, and—since it would have been brought about by act of Congress—a government-aid. Yet it would have involved *no subsidy*.

Of similar status was the proposal—also before Congress for some time—to authorize housing loans from the Postal Savings Fund. Its great merit was that, as Postal

Savings pay but 2% interest to depositors, housing loans could have been made without loss at $2\frac{1}{4}\%$, which would have opened the possibilities of home ownership to a large economic group at present debarred from it.

Quite in the same category, was the Housing Loan Bank proposed to the New York legislature in 1926 by the State Commission of Housing and Regional Planning and endorsed by Governor Smith. The public were to invest in housing loan bonds to be issued by the bank at an interest rate around $4\frac{1}{4}\%$. The State Board of Housing was to lend the money so obtained, on first mortgage security, to approved and supervised limited-dividend housing companies. This is the function now being fulfilled by the Metropolitan Life Insurance Company. The advantage, had the bill passed as written, would have been in a somewhat lower interest rate and a larger potential supply of capital. *There would have been no subsidy.*

This is also precisely the situation of the Michigan Housing Association's pending proposal. Dr. Herman and his associates are seeking a constitutional amendment to permit the establishment of regional revolving funds within the state of Michigan, to be created by the issue of housing bonds secured by regional credit. Loans are to be made to limited-dividend housing companies, approved and supervised. *There is absolutely no subsidy involved.* If the legislature and people of Michigan decide to try this plan, it will give to the small-income home-purchaser (1) a low interest rate, (2) a long period for repayment, (3) a minimum requirement for cash down, and (4) safety from exploitation.

In California, an act for the benefit of veterans per-

mits 20-year loans for the acquisition of a home or farm, which may cover as much as 95% of the cost thereof, but must not exceed \$5000 for a home or \$7,500 for a farm. The interest rate is 5%. As the State pays only $4\frac{1}{4}$ or $4\frac{1}{2}\%$ for the money, the difference is amply sufficient for all costs of administration. Clearly, *there is no subsidy*. This is not a bonus. Already 4919 homes and 248 farms have been built or acquired. There have been over 32,000 applications for loans, of which 16,658 have so far been approved. The advantages to the borrower are (1) low interest rate—California Building and Loan Associations charge $7\frac{1}{2}\%$, (2) long time, (3) small amount of cash payment, (4) safety for himself through the supervision which protects the State from loss.

There are other instances of government-aid in house financing without subsidy in actual operation on a small scale in Wisconsin, Massachusetts and Oklahoma, which I pass over for lack of space.

We have also two instances of negative subsidy in the form of tax exemption—that which was granted to all new dwellings in New York City for several years following the War to stimulate building; and that which is now being granted to limited-dividend and cooperative companies approved by the State Board of Housing. That the New York legislature should have twice accepted tax exemption subsidy, while always rejecting non-subsidy loans, is an interesting instance of straining at a gnat and swallowing a camel.

THE EXAMPLE OF EUROPE

It is more illuminating to talk about European policies and practice, for there we have more than a half

century of experience, culminating in activities on a tremendous scale, homes being built by the hundreds of thousands in a movement that is accomplishing—at varying speed in the various countries—a peaceful social revolution in the standard of living.

There are three main forms of housing activity in Europe which differ from the usual ones in this country. They are

- (1) Slum clearance—to get rid of the hopelessly unredeemable housing sins of the past.
- (2) Housing loans at low interest rates to encourage home ownership or co-operative or limited-dividend housing.
- (3) Housing by public authorities.

Slum clearance has been carried out on a far smaller scale than the other two, because it almost invariably costs money, which the tax-payers have to provide. It is appealing because it attacks the worst conditions directly. It may easily be argued that it is a good investment, since it results in better health and reduced delinquency, juvenile and adult. It probably saves more than it costs in hospitals, reformatories and relief.

Whether it is wise for government-aid in housing to limit itself to a system of loans with incidental supervision, or whether public authorities should be prepared to step into the breach themselves to build and rent to those who fail to obtain wholesome homes either commercially or through the loan system, is a question which has little immediate importance in the United States. We are now at the point where Great Britain was 78 years ago, where Belgium and Germany were 40 years ago, France 35 years ago, and Holland 28 years ago, debating whether or not nation, state and city

should provide housing credits, on an at-cost basis, to cut down the price of wholesome housing to be within the reach of lower income groups than can otherwise attain it.

In briefest terms this is what they did. Great Britain made loans from her public debt sinking fund to Public Utility Societies—approved limited-dividend housing companies—and also to Local Authorities wishing to build and rent. Two-thirds of needed capital was loaned for 40 years at a minimum rate of $3\frac{1}{2}\%$. No subsidy was involved.

The Belgian system, dating from 1889, is especially aimed to encourage home ownership. Loans are made to working people—maximum income fixed—from the funds of the General Savings Bank, for the building or purchase of a home. Loans run for 25 years and may cover 80% of the value of house and land. Payment of interest and principal is made monthly or fortnightly. There is a life insurance feature which covers the mortgage. About one tenth of the families of Belgium, all below the economic level to do so commercially, have acquired homes under this system. No subsidy is involved.

New Zealand is another outstanding protagonist of home ownership. She has used chiefly her Advances to Workers Act of 1906. The money is obtained by an issue of housing bonds. The rate of interest is determined by that which the bonds pay. There is no subsidy. The system has been conspicuously successful in that progressive commonwealth, as well as in the states of Australia, all of which have copied it.

Holland is another country which issues housing bonds. The purpose, however, is not to encourage

home ownership, but limited-dividend and co-operative housing Societies. In this case, also, interest rate depends on that of the bonds. Being made to Societies instead of to individuals, the loans run for 50 years. They are unique in furnishing the entire capital needed. Previous to 1919 no subsidy was involved, and a return has now been made to the pre-war status.

Germany, the Scandinavian countries, France and Italy have furnished much credit for housing. Before the War they did it without subsidy.

Municipal housing, resulting in tens of thousands of cottages and flats, was farthest advanced before the War in England and Germany. Except when connected with Slum Clearance, it was a self-supporting public utility—like gas or water.

After the War an acute housing shortage was found to exist throughout Europe combined with a complete dislocation of prices. The old ratio between wages and cost of building had been destroyed. If, houses were to be built at that time for those who needed them, they must be subsidized. During the year 1919 housing subsidies were adopted in most European countries as temporary emergency measures, because they were considered a lesser evil than indefinite delay. In some countries they are no longer in use. In others they have been greatly diminished.

Wholly exceptional in this picture are the recent housing activities of Vienna, which are based on essentially socialistic financial premises—and still more so are those of communist Russia. Neither represents the goal toward which such conservative-democratic countries as Great Britain and Holland are traveling, but are the explosive result of long years of autocratic

repression. The lesson conveyed is not without its point.

As to the amount accomplished, Great Britain is carrying out a 15-year programme for the building of two and a half million (2,500,000) small homes, financed by government loans and, so far, aided by subsidy, though the amount is diminishing progressively. Today, over a million such homes are built or building in England and Wales and over 100,000 in Scotland. Nearly half in England and Wales are the work of private builders who sell at a supervised price to small-income white-collar families. More than half—a much larger proportion in Scotland—are built by local Authorities to rent to working-class tenants. This represents the re-housing of about one-ninth of the population. The standard set is extremely high, especially in England, where single-family brick or concrete cottages are built, containing 5 or 6 rooms and a bath, hard wood floors, electric lights and gas range. Those built by Local Authorities are in open layout, 12 to the acre in cities and 8 in the villages. There are gardens, shrubbery, tennis-courts and play-grounds.

Holland has done even more in proportion to population; for, she has, during the past few years rehoused no less than one fifth of her people with government credits and subsidies. Most working-class groups there are housed by co-operative Societies. Municipal housing is chiefly residual. It has come to be recognized that for a small group below the line of self-support housing will always have to be subsidized. For all others it is now back on the pre-war basis.

Germany, also, in spite of her financial condition, has built more than a million apartments and cottages

for her workers since the War and has been rewarded by a striking drop in her death-rate, which is now lower than that of the United States. So also are the death-rates—general and infant—of England and Holland. Those of London are lower than those of New York.

In all this post-war work the subsidy is regarded as part of the cost of the War. Housing with government-aid had reached the stage of rapid expansion in 1914. England and Germany had each produced by these means more than 100,000 homes without subsidy. Had there been no war, there would have been no subsidy—except in connection with Slum Clearance—and the amount of building done would undoubtedly have been greater than what has actually taken place under the handicap of subsidy.

WHY WE NEED GOVERNMENT-AID IN THE U. S.

Having made it reasonably clear, I hope, what form of government-aid in house financing we are talking about, and that it has proved its usefulness abroad, it remains to be shown why we need it in the United States.

The housing problem, here as elsewhere, is fundamentally economic. The distribution of income and cost of building are such that only a third of the population can afford to buy or rent a new home. This is demonstrable if there were time. Taking the country as a whole, about a third of our families have incomes of \$2000 and over. The middle third range from \$1200 to \$2000. The lowest third have less than \$1200. The top third are well housed; the middle third only fairly; the lowest third badly. Their health, morals, efficiency and family life are being seriously damaged. Only the top third can control their environment without help.

Any radical improvement in the situation implies the building of a large number of new homes and the scrapping of a large number of bad old ones. This will never be done by private business initiative, because not even the middle group, much less the lowest one, can pay a profit on a new home. When the wants of the top third are supplied, commercial building ceases. Middle group families can occasionally buy an old house, with the help of the Building and Loan Association, but not a new one. Limited-dividend housing helps a few members of the middle-income group to better housing than they could otherwise attain. But there isn't anywhere near enough of it, nor does it cut prices far enough.

This is where the policy of government housing-credits to co-operative and other limited-dividend housing companies—officially approved and supervised—would come to the rescue, since it would permit the building of new homes for the middle group whose wants in that direction must now remain unsatisfied. It would probably not bring new housing within the reach of the lowest-income groups, but they could move up a grade into the homes vacated by the middle group. The worst of the old houses could eventually be scrapped.

It is clear that this would, so far, involve no subsidy. It would not interfere with the work of the private builders, who would continue to cater to the only section of the population which they have ever supplied. Contractors, material men and building trade workers ought to welcome a policy which might double their activities.

As to Building and Loan Associations, no one admires

their work more than I do. They serve the lower part of the top third of these income groups for new homes and the upper fringe of the middle group for old houses in a thoroughly admirable manner. They do not and cannot serve the masses who have not sufficient margin of income over necessary expenses to accumulate a third of the capital needed for a home, who cannot pay 6% interest on what they borrow—the rate is higher in the West—and who cannot repay their mortgage principal in 11 or 12 years. They have not yet reached their limit of growth for the classes they serve. Since they are investment institutions as well as lending institutions and cannot cut their profits to the point where they could serve the lower income groups, it is to be hoped that they will not adopt a dog-in-the-manger attitude of opposing non-competing agencies which do. But that matter of non-competition is something that must be looked out for. The benefit of the proposed state-controlled housing loans should be carefully limited to those below the income groups which can use the machinery of the Building and Loan associations.

What I have described, however inadequately, is the logical next step for us in the United States. It would help a large and worthy class to achieve better homes. Whether it would prove sufficient by itself to solve all our housing problems can only be told after a full and fair trial. It did not prove enough in Europe. They had to adopt municipal housing and Slum Clearance. But the financial status of our workers may be enough better here so that loans will suffice. If not, there are the steps beyond which may be taken.

If after trying out all that can be done without municipal housing and without subsidy there is still a badly

housed residuum, need we be unduly terrified at the thought of taxing ourselves for Slum Clearance and re-housing? That one-per-thousand difference between the death-rate of England, Holland, Germany and our own means 120,000 preventable American deaths each year. The number would be much larger if the New Zealand death-rate were the standard of comparison. It would be worth some outlay, even on economic grounds, to save that number of American lives. Our annual crime bill is variously estimated at from 7 to 13 billion dollars. If even a tenth of it can be traced to bad housing in early life, common sense might seem to dictate a preventive investment for the future.

The determining of American housing policy calls for efficiency engineering of the highest type and a well-developed sense of proportional values.

(For the Discussion of this Paper, see page 296.)

BUILDING AND LOAN ASSOCIATIONS AS HOME-FINANCING AGENCIES

GEORGE L. BLISS

Vice President, The Franklin Society for Home-Building and Savings

I regard it as unfortunate that whenever any problem presents itself in this country, there are people who come forward with the suggestion that government-aid is the only solution to that particular problem. This is apparently the case in the financing of home construction.

If those who believe that government-aid is the only solution to the problem of home financing are to prove their point, they must, it seems to me, establish two things:

First, that existing facilities for home financing are inadequate; and

Second, that the government is better equipped to handle this work than any other agency.

Both of these claims can be easily disproved. And it is my purpose to demonstrate that Building and Loan Associations meet this need better than any other agency. Philadelphia is known throughout the country as a city of home owners. There is a coincidence between that fact and the fact that Philadelphia is the home of the Building and Loan Association.

Founded here some hundred years ago, there are today over 3500 Building and Loan Associations operating in that city alone: and Pennsylvania is the leading Building and Loan state in the country.

Expressed briefly, Building and Loan Associations—which are essentially savings institutions—take the savings of the people and invest these funds in monthly payment mortgage loans on residential properties. By a system of monthly payments whereby the borrower pays \$10 to \$12 a month for each \$1000 of loan—a portion of which is applied to the payment of interest and the remainder to the liquidation of the indebtedness—the ownership of a home is completely acquired in about 12 years.

This may well be called the original installment plan; but it is an installment plan in a constructive and productive form. Over 92% of the funds of the Building and Loan Associations of the country are so employed—in mortgage loans, on the monthly payment basis, on residential properties, generally one, two or three-family homes. Building and Loan Associations lend 60 to 80% of the fair appraised value of the property, leaving from 20 to 40% to be provided by the home owner.

They are able to lend such a heavy proportion because of their appraisalment of the moral hazard. In the smaller type of Building and Loan Associations, the individual borrower is known to the board of directors, and the moral hazard is taken into consideration when the loan is made. Even in the large Associations, careful investigation is made of the moral risk before any loan is granted; and it has been the experience of these Building and Loan Associations that any citizen who has a good character and a job is a perfectly safe risk for these higher percentage loans.

There is a further factor. In a straight or flat mortgage it is necessary to discount depreciation in advance;

but in the Building and Loan Mortgage depreciation is taken care of by the monthly payments. This high percentage loan eliminates or greatly reduces the need for the expensive second mortgage.

THE EXTENT OF THE MOVEMENT

At the end of the year 1927, the 12,900 Building and Loan Associations of this country held mortgages of \$6,584,000,000. It is estimated that at this time the figure has increased to \$7,250,000,000. Since the average loan held by these Associations is in the neighborhood of \$4,000, this means that 1,812,500 homes are being so financed. It is evident that the Building and Loan Associations are meeting the home financing needs of the country.

Building and Loan Associations are growing at the rate of 15% per annum, which is more rapid than the growth of population. Since 1920 their growth has been from \$2,000,000,000 invested in loans to seven and a quarter billion dollars. In the year 1925, the Associations in 15 states only, placed \$1,100,000,000 in home loans. In 1926, in 16 states, the Associations placed \$1,200,000,000, and in 1927 in the same states, \$1,280,000,000.

Take these 16 states for 1927 alone; at an average of \$4000 per loan, that represents 320,000 homes financed. Unfortunately, the figures for the other states are not available in that fashion. But in these 16 states, in view of the fact that these figures include a goodly proportion of two- and three-family houses, it is safe to say that there is covered a financing of homes in that one year, in these 16 states only, sufficient to accommodate 2,000,000 people.

Throughout these years, the Building and Loan Associations have been going about their work quietly. I think they may be subject to criticism for their lack of a merchandising policy. They have suffered from the old-fashioned idea that if they went about their work and did it right, they would prosper accordingly. Many of them had no sales campaign or advertising appropriation of any description; and yet, despite that they have grown as indicated.

The growth of the Building and Loan Associations has been very largely brought about in this fashion.

HOW IT OPERATES

The ordinary individual only buys or builds one home, and he is therefore as unversed in how to go about it as any one might be expected to be who only performs one task once in his lifetime. So, this individual goes to his neighbor who has a home, and says "How did you arrange it? Where did you get your money?" And the neighbor says "I went down to the Building and Loan Association."

So, he goes down there, talks with an officer, finds the plan simple, files his application and is soon added to the roster of those who are making monthly payments to the Building and Loan Associations.

People who have not become acquainted with the Building and Loan Association in that way are unaware of the extent to which they have been growing and developing. Living perhaps in a city apartment, they have not been aware that throughout the length and breadth of this land, the Building and Loan Associations are quietly, without noise or drums, going ahead financing the individual home owner.

Following the war there was a condition of housing shortage brought about by the devotion of our resources and energies to the winning of the war. In the years that have elapsed, that housing shortage has been materially lessened. As a matter of actual fact, the Building and Loan Associations in a number of states today are seeking good mortgage loans. In Massachusetts, New York, Louisiana, Nebraska, Wisconsin, California—to mention only a few, where the Building and Loan Associations have met every demand that has been made upon them for mortgage money for home purposes—they are now out seeking loans, competing with other agencies in the home lending field. There are cities in this land of ours where the development of the Building and Loan Association has been such that these cities are fully housed. Some Building and Loan Associations today are in a position where they have money that they do not know what to do with—two outstanding examples of which are Shreveport, and Omaha.

GOVERNMENT IN PRIVATE BUSINESS

There is however an aspect above and beyond this. If present facilities were inadequate—which they are not—would government housing aid be any better? Governmental agencies are not economic and should not be put to economic purposes.

The very principles of democracy themselves are destroyed when the government undertakes to do for the people what the people can better do for themselves. The experience of the injection of government into other fields should be a warning. The government's operation of the railroads during the War, its interven-

tion in the shipping industry are cases in point. A striking instance is found in the state of New York, where it has been said that if all the freight carried by the New York State Barge Canal were loaded on freight cars and the state paid the freight bills, it would cost the state less than it did to maintain that canal.

When the government enters into a field which properly belongs to private enterprise there is a stifling of individual effort. In economics we all know Gresham's law, which is that the introduction of cheap or fiat money drives good money out of the market and into hiding. If government were to enter the field of financing the home owner, it too would drive from that field by its unfair competition the private efforts now in force.

Rather it should be our purpose to build in the individual the desire to strive and work for himself. We should guard against a tendency to put government operation into competition with private endeavor. Paternalism in government grows by what it feeds upon, broadening down from precedent to precedent, until, the people grow into the state of mind where they look to government to support the people, rather than the people to support the government.

THE EFFECT IN ENGLAND

There has been some reference made this afternoon to housing in foreign lands. I have never been in England. I know that distant fields look greener, and I am reminded of a statement made by an English economist, who referring to the operation of government housing in England, said

It has done much to destroy private initiative. It is, in effect, an extension of the dole system by which

some people are compelled to support others, because the state refuses to give everybody the opportunity for self support. It has increased bureaucracy in government; it is to a high degree inefficient and wasteful of public resources; it encourages land monopoly and speculation, and finally it can, in the nature of the case, only be a very small amelioration of the difficulties of the working man.

Charles O'Connor Hennessy, of New York, in an investigation of this field, discovered the interesting fact that

A 5-room cottage that was built before the war for approximately £200, or approximately \$1000, rose rapidly in cost after the passage of the Addison Act in 1919 until it reached a peak of about \$4500 in September, 1920, as against the 1914 price of \$1000. This refers entirely to the cost of the structure and does not include the cost of land. That the high prices of land, material and labor were to a great extent artificial, was indicated by a decline of prices when a new cabinet minister in charge of housing came in and refused to sanction the payment of public moneys for excessively priced construction.

The result was a rapid decline in costs, so that the small type of house that a year before had cost public authorities approximately \$4,500, was being built for less than \$3,000. The price continued to decline under threats of the withdrawal of the subsidy, until in September, 1923, it had reached \$1,750. After that date there was another change of ministry, and, incidentally, a talk of increased subsidy to promote a more rapid production of housing. Immediately, the prices of land, building material and labor stiffened all along the line. So that in September, 1924, the average cost of the small five-room house to which I have referred had risen considerably. During the last twelve months it appears that there has been a

tendency to stabilize the prices of building materials and building costs have not increased. There are some critics who assert that this moderation of the building material producers has been due to the threat of competition by the engineering trades who are now producing in increasing number the material for factory-made steel houses.

A SUBSIDY IN ESSENCE

I am unable to see the distinction between a direct subsidy and the lending of the credit of the government. If the government lends its credit, it does two things. In the first place, it enters into direct competition with existing private organizations. In the second place, it has made a subsidy because it has guaranteed the financing in the event that the financing does not prove to be self supporting.

There seems to be something mysterious about the term "limited-dividends." Limited-dividends are looked upon as a cureall for all of our financial problems. But there is an economic law that goes back of anything of that nature. Limited-dividends will not prove a cureall. Limited-dividends, rather than attracting the finances required to meet a problem, will tend rather—as in the operation of Gresham's law—to drive other money out of the field.

But in the Building and Loan Associations we have something far superior to limited-dividends. We have cooperative banking, encouraging the individual to save and to provide for himself, providing home financing at the market rate but without private profit—the return there accruing to the share holders in these mutual cooperative institutions.

(For the Discussion of this Paper, see page 304.)

SLUM CLEARANCE

LAWRENCE VEILLER

Secretary, National Housing Association

Before we can discuss a policy or programme of Slum Clearance intelligently we must reach some kind of an understanding in our own minds as to what is a slum.

I find that different people have very different ideas of what constitutes a slum. The average person who sees a street that has not much architectural attractiveness or where there is great monotony, with what might be called a drab outlook, says, "That's a slum." Other people when they see a street where there is great lack of repair, with houses quite dilapidated, say "Surely that's a slum."

Whereas, in my own city of New York, our houses are quite fair to behold from the outside, but from the inside many of them are certainly whited sepulchres. And we rightly consider many of those districts slum districts.

I do not wish to be meticulous in attempting to define the term nor to object to people's use of it where it may mean very different things. The term has its popular values. We all, in a sense, know what is meant. When we talk of slums we mean, in a general way, a section of a city that has run down, from one cause or other, so as to be disadvantageous to the community.

If we try and take the English definitions, we get into all kinds of difficulties over here. For instance, I read

the other day in a very interesting discussion of slums, a definition by George Duckworth, a man who had spent ten years of his life with Charles Booth, in that epoch-making investigation known as the *Life and Labor of the London People*.

He defines a slum as follows:

A slum is a street, court or alley which reflects the social condition of a poor, thriftless, irregularly employed and rough class of inhabitants.

I am sure that we all agree that that definition does not apply to many of our slums, though it may to many of the European slums.

Again he says, "The outward signs are bread and litter in the streets." "Bread and litter in the streets"! We have heard about casting our bread upon the waters, but never about casting it into the gutters.

He goes on further, however, and says "Windows dirty, broken or patched with brown or white paper."—I wonder if it would have escaped the category of a slum if the windows had been patched with a newspaper! "Curtains dirty and frayed and blinds half drawn and often hanging at an angle. The street doors are usually open, showing bare passages and stairways lacking balusters, while the door jambs are generally brown with dirt and rubbed shiny by the coat sleeves of the leisured class whose habits are to lean up against them."

Now, mind you, this is the definition of a slum by a man who has worked for ten years in the English slums and knows them. It shows how different the conditions are there from what they are here. Similarly, if one were to describe a Philadelphia slum, it would be quite different from a New York slum.

It is a question of standards. I find that what we

considered pretty good conditions twenty years ago, some people today are actually calling slums.

One of the difficulties encountered at the present time in England by those attempting to solve their housing problem, is the insistent demand—coming from many groups in the community, and especially from the Labor group—that practically all houses built prior to the war should be destroyed. To their minds they are all slums. Whereas, to us many of the streets that English Labor calls slums, we in New York would hail with joy. Because, the houses are only two stories high, there are no problems, of light and air. And while the houses and streets are drab and uninteresting, because of their monotony, they are on the whole rather good places to live in.

So, we must start with a clear idea in our own minds as to what a slum is. There is much confusion of thought on the subject.

In the last two or three years we have had a good deal of discussion in New York on this question of Slum Clearance. And I have been interested to observe that different groups in the community seem to be looking at the problem from quite different points of view. Some people consider everything old as a slum. Mayor Walker, I think, said on one occasion—he suffers from speaking rather easily—that he blushed to think of any archaic buildings still remaining in the city of New York and he hoped that the time would come when there would not be one left. That is rather a large contract; and, perhaps not a wise one. From Mayor Walker's point of view, apparently, a building that is old fashioned or archaic, is a slum and to be torn down.

Some people, when they see a district where values

have depreciated and where there are many empties, think it is a slum and that it should be torn down. Then, of course, people's standards and knowledge of what is insanitary—vary greatly. I have never forgotten the shock I gave the Police Commissioner of Baltimore, some years ago, when he sent for me to come down from New York and tell him what I thought about their slums. They had picked out what they thought was a horrible example of a rear tenement. With perfect confidence the Police Commissioner took me to see it and said "You will admit, of course, that this ought to come down, this is a slum." I said, after examining it, "Not at all; I can see this house with new paint on the outside and gay-colored window boxes in the windows and pretty white dimity curtains, so fixed up that the people in Baltimore who saw it would say "How charming, how quaint!" It was a perfectly good house. That experience just shows that it isn't safe to generalize.

THE SLUM A CIVIC CANCER

It is rather significant when we come to think of it that we are talking about *Slum Clearance*. What does that fact mean? It means that the housing reformer who has been dealing with individual insanitary or dilapidated houses, has now come to a stage where he finds so many of these houses—and finds them in such a far-advanced stage of disrepair—that he no longer can profitably deal with the individual house, but must deal with a whole area.

It is a perfectly natural and logical step. All of us who are in housing work are dealing, day by day, with the improvement of the individual house—doing it in all kinds of ways—and when we find it no longer profitable

or feasible to improve the individual house, and that there are many of these, it is a natural and logical step to take the area and try and improve that.

In other words, we have come to the conclusion speaking in medical terms, that there is a civic cancer which must be cut out by the surgeon's knife—and there is not any figure that describes a slum better. It is exactly like cancer in the human body. It can be cured by radium, if taken in time; but after it has gotten to a certain stage, it infects the body politic, and the only cure for it is to cut with the surgeon's knife. That is what we mean by a Slum Clearance Scheme.

I am not going to discuss the opportunities and possibilities of improvement of whole neighborhoods by effort with individual houses. What I shall discuss is this surgical treatment—the clearance of a whole area, the cutting out of the cancer on a wholesale basis.

The question however that is difficult is, Having reached the conclusion that we should do this, *how* are we going to do it? And, being a practical people, we naturally ask ourselves "Is there any experience to guide us? Has any other community done anything that would help us?" So far as America is concerned, the answer is, practically, "no." There have been a few sporadic efforts. Perhaps in order to keep the record straight and not be charged with misstatement, I should state briefly what they are. In New York City about twenty-five years ago, a few whole blocks in congested sections were condemned, cleared, and their sites turned into small parks and playgrounds. There were three or four such efforts. Of course there have always been in New York the constant orders by the Board of Health, in the old days, for the improvement of individ-

ual houses; but, so far as wholesale clearances go, you can count them on the fingers of one hand. In Boston they cleared out portions of a few blocks some years ago. In Cleveland they have condemned individual insanitary houses. In Washington they have cleared out a few alleys. Beyond that, there has been no Slum Clearance work in America.

ENGLAND'S EXPERIENCE A GUIDE

The one country that has done more than any other in the world is England—and she has been doing it for fifty years or more, not only in London, but in most of her leading cities and in the two leading cities of Scotland. The work started I think in Liverpool. London took it up actively in 1875, and Manchester, Leeds and other cities; Edinburgh, and Glasgow have done it for a long time. Therefore, England offers a very helpful field as to how to do it.

Can we follow the English method? Is what they have done of any use to us? I think it is a lot of use to us. Of course there are variants in the conditions there and the conditions here—just as there are in new housing. You could not, for example, induce an American working man to live in a new English Garden City house; and you could not get an English working man to live in a fine American house—simply because their habits and customs are different.

Making allowance for that element of differences in different peoples, we still, I think, can be guided by the English example. I am not going to attempt to state the number of houses that have been cleared and demolished in England in this period of fifty years, nor the millions of pounds that have been spent on this work.

Both sums are rather vast, but, as no one has ever accurately stated them, I cannot furnish information as to what the total amount is. If the information existed, I should be glad to give it.

AN ORDERLY PROCESS

In the first place, the term "slums" over there is not known in the law or in their procedure. The authorities are dealing either with "unhealthy areas" or "insanitary areas." The basis of everything they do, therefore, is in finding that the area they propose to clear is insanitary.

Their process is orderly and fair. In the first place, the local medical officer of health must "present" an area, as they put it. He must make a finding that a given area in his district is insanitary and dangerous to health. Then maps must be prepared. These maps are colored in two different ways, pink and blue. The pink maps represent property which is so insanitary in itself that it ought to be torn down, and for which no compensation is to be paid. The blue represents property which is not insanitary at all, but which is necessary to the carrying out of the Scheme. In other words, in a block of houses if all the houses at one end are insanitary and there are three or four in between that are not insanitary but are necessary to the clearing of the rest of it, they take that property along with the other.

These maps are presented, many public hearings are had, and the owners have their day in court with counsel to present all the facts. The shop keepers, the people whose business is going to be destroyed, all have their day in court; and, finally, the Scheme must be approved by the central government—the Ministry of Health.

After that has been done, the property is taken. That, as I say, is an orderly process. Then the Local Authorities carry out the scheme.

But it is not so easy as it seems. It takes years to carry out a Slum Clearance Scheme. This is due to the fact that they have two almost insuperable difficulties to overcome—provisions which were written into the very first statutes, back in 1875, and which are still the law today and which condition everything they are doing.

These two difficulties are these. They must rehouse the same number of people that they displace and they must rehouse them in the same kind of accommodations so far as their financial means go. I do not mean the exact rentals, but very close to it.

NO COMPENSATION PAID

Another difficulty is, that, under a law which some housing reformers in England thought marked a great advance—but which I am inclined to think was the contrary—they pay no compensation for the house at all. That is just thrown away, scrapped. They take my house and I get nothing for it. We must bear in mind, that the land and the house in England are generally owned separately, so that John Smith may own the land and I may own the house. They compensate him for the land, but they give me nothing for the house. I am talking about what happens in the case of the “pink” property, where the houses are found to be in insanitary condition—as the greater portion of those condemned are. In addition, they do not pay the owner of the land the value that he could get for it if used for shops or factories or office buildings, but only its value if used for housing purposes.

The public authorities themselves in England, especially in London, consider this so unfair an arrangement that they hesitate to inaugurate new schemes. It seems to them so inequitable that they have not the heart to condemn men's property, to drive out the people occupying these places and not compensate them.

In addition, the political repercussions are such that they know the scheme is not likely to be approved. So eminent and distinguished a person as Mr. Frank Hunt, the Valuer of the London County Council, who has all this work under his care and has had it for the past twenty-five years or more, told me when I last saw him a year or two ago, that this was the chief reason, why Slum Clearance work in England did not make greater progress.

When we start in on Slum Clearance work in this country we should consider this aspect of England's experience and determine whether we want to pay fair compensation and also whether we want to impose a condition of rehousing the displaced population. I do not think we do.

I think our people can be left to find new homes for themselves. We had a striking illustration of that 20 years or so ago. In connection with the Williamsburg Bridge in New York they tore down, all at once, about 10 or 12 blocks of tenements and displaced a population of about 10,000 people. The city authorities never concerned themselves about re-housing these people, but said "They'll take care of themselves." And they did. It was a Jewish section, and they all migrated across the river to Brooklyn. So from that time to this, the bridge has been known as the "Jewish Passover." I cite that as an illustration of our different point of view

from the English. We think people can take care of themselves. They feel they must take care of them.

HAS AMERICA SLUMS?

One asks one's self "What is the situation in America? Have we slums in most of our cities?" And the answer is, "No, we have slums in some cities—comparatively few." But we have slum areas or 'slum spots,' in most of our cities—small little districts, but not great stretches of territory.

In New York, Chicago, Cincinnati and St. Louis we have slums and slum areas extending for a large distance, often for many miles, in some of them. But in most of the other cities we do not have them; we do, however, have slum spots.

I ask the question, "Has the time come to embark on a slum clearance policy?" And the answer emphatically is "Yes. We certainly should. We ought to have taken it up long ago, but we did not get to it."

How shall we go about it? It depends on what we are trying to accomplish. In the discussion of this question which has been raging in New York for the past two or three years, but where nothing has eventuated as yet, there has been evident great confusion of thought.

One group has said "We want to get rid of insanitary buildings." Another group, "We want to get rid of archaic and obsolete buildings." Still another group says "Here is a whole section on the East Side that has a great many vacant buildings; we want to rehabilitate values and restore that section to prosperity." Others say "We want to replan the city, to make it over."

We must decide what to do before we start to do anything.

AUTHORITY OF LAW

First, we must have authority of law. We must have express power to act; and, under two conditions. We must be empowered to clear areas because they are insanitary—there can be no dispute about that, I think. And we must also have power to clear them because the public interest indicates that their demolition is requisite. These are two quite distinct things.

Then, secondly some kind of functioning group must be created to do the work. If you want to get your slum cleared, don't leave it to any existing body, or you will never get it cleared; they have got too much to do now. In the city of New York, to ask the Board of Estimate and Apportionment to clear slums is expecting the impossible. If you want it done quickly, within two or three years, you must put a special group on the job.

FAIR COMPENSATION

Third, there must be an equitable basis of compensation—one that is fair to the city and to the property owner, as well. The great trouble in America has been that under condemnation proceedings in most of our cities, the city has had to pay through the nose, double and treble the real value of the property. We must try and find some system of overcoming this. I had thought that we might adopt what is known as the New Zealand system, of paying 10% over the assessed value of the property. But, unfortunately, that is not constitutional in New York. We would have to amend the constitution to do it.

The man whose property you take must be properly

compensated, and he must have something extra for the inconvenience and loss he is put to for having suddenly to give up his property.

We must also decide what we are going to do with the cleared area. In England it is not so difficult, because there their policy is to rehouse the displaced population. That is foreign to American practice and principles. I am not going to discuss this question, however, because you are to have it discussed this afternoon by Mrs. Wood and others.

WHAT SHALL WE DO WITH THE SITE?

But we must determine what we are going to do with the area before we select it—before we decide “This is the block that must go; this is the whole section that must be cleared.”

What can we do with it? We can rehouse the dis-housed population, or we can rehouse a different kind of population, assuming that we overcome the objections to rehousing that prevail in this country. Or, we can open new streets or widen streets and make new arteries of traffic. Or, we can make great open places, depending on the needs of the city. Or, we can make small parks or recreation places. But in any scheme we adopt we have got to find some way of reducing the cost to the taxpayer—otherwise we will do one scheme and stop.

An ordinary city block on the East Side of New York would cost today nearly a million dollars to acquire. You cannot spend many millions in that way and make the taxpayers pay for it, because they won't stand for such an increase in the tax rate.

A PRACTICAL PLAN

The plan that seems to me to have the most practical features in it, is a plan originated by Mr. I. N. Phelps Stokes, the New York architect. That was this: To have the city acquire a whole city block, raze all the buildings on it, sell off strips on each outer side, 30 feet or about 30 feet in width, to a limited-dividend company to build model houses on. In New York these would be tenements, in other cities small houses.

The whole center space, instead of being left vacant for private back yards, would be taken over by the city as a park or recreation ground. Such a development might extend in this fashion for miles and would practically rebuild the city with model houses, only two rooms deep. The houses could occupy 100% of the lot and the city would get its parks and playground, which it properly should pay for, at about half to two-thirds of the cost of the ordinary condemnation methods.

Finally, whatever is done, in Slum Clearance must be done in harmony with the Master Plan of the city—assuming that you have one, and if you have not one, the sooner you get one the better. It is foolish to tear down property at great expense and put a small park or playground there if, three years later, you are going to drive a great artery of traffic through it.

TO SUM UP

To sum up: A Slum Clearance Programme involves

A definite policy,

Express legal power to proceed,

A special "authority" to do the job,

Fair basis of compensation,

A use for the cleared area in harmony with the law, with public policy and the city's Master Plan, and

A sharing of the cost that will not make such schemes prohibitive.

SLUM IMPROVEMENT BY PRIVATE EFFORT

HAROLD S. BUTTENHEIM

Editor, The American City

A major cause of controversy in this world is inadequate precision in the use of words. Unless we are deliberately employing language as a vehicle to conceal thought—or the lack of it—accuracy of statement demands clarity of definition.

What is a slum? It is surprising to discover that in even the latest editions of our leading dictionaries, the word *house* does not appear in the definition of slum. According to Webster's New International, a slum is "a foul, back street of a city, especially one with a slovenly and often vicious population; also low or squalid neighborhood," and Funk and Wagnalls' New Standard dictionary defines a slum as "a low, filthy quarter of a city or town; a street or place where debauched and criminal persons live or resort."

For the purpose of this paper, however, I shall use the word slum in a sense broad enough to cover all housing which, because of its poor construction or dilapidated or insanitary condition, is unfit for human habitation.

The request from the National Housing Association to prepare this paper followed an interview which one of The American City's associate editors had with a London landlord, Claude M. Leigh, prior to Mr. Leigh's return to England from a visit to America. Describing

his method of reconditioning and operating working-class tenements and houses, Mr. Leigh said:

My scheme is not one of slum clearance, but of slum prevention. Because, when you arrive at that stage when a block of property has become a slum, there is nothing else to do but to tear it down and rebuild. My scheme is one of reconditioning properties in areas that are becoming slums. One of the most important factors is to deal only with property that is structurally sound; that is, where the four walls are sound. I have purchased blocks of property in various parts of London, in almost every case in densely populated districts, and my procedure is this:

The first thing I do is paint the whole of the exterior a very pretty green, a color that is very seldom seen in that class of property—attractive without being gaudy. That is the beginning, really, of the education of the tenant, inasmuch as the tenants immediately say, “What is all this about?” or “What a beautiful color,” or “What a terrible color.” It makes them talk. Having finished that work, I send a letter to each of the tenants, pointing out that this particular estate will be administered on my cooperative basis, cooperative so far as it means the tenants’ cooperation with me for the economy and good management of the estate. I usually get a good many replies saying they will be very happy to cooperate.

An inspection is made of every apartment and the apartments are thoroughly redecorated. Very often it is found necessary to take down

walls, to make two rooms into one, or two rooms out of one—our system of education, is as it were, continued. Instead of papering the walls with a drab-colored paper, I endeavor to persuade the tenants to have washable distemper or paint. They do not take it very kindly at first, of course. Instead of painting the wood-work a dark brown or some color that doesn't show the dirt, we paint it some light color. I have also introduced ironing-boards in some cases, and always install a built-in dresser. We put wash-houses on the roofs, which are usually flat, and perambulator garages in the yards.

While this is being done, we do not inconvenience the tenants. They have to help by giving possession of one room at a time. There are two reasons for this—the most important one being that there is nowhere to move them, and the other is, that owing to the Rent Restriction Act—which is still operative—we cannot get possession of an apartment.

The apartments that I control average from 2 rooms to 5 in tenements, and a number of small houses of two stories and over. The tenement blocks average 6 stories in height—approximately 24 families to the building—and in the other houses, as a general rule, there is a family on each floor, very seldom more and very often less.

Rent for this class of property in London is usually paid weekly, and is inclusive of all payments, including rates, taxes, insurance, janitor service, etc. Although the Rent Restriction

Act prohibits an increase in rental of more than 40% over the pre-war standard—this is net rental, which means the rental less the amount that was then included for the rates*—the additional amount of rates over and above the pre-war rates the owner is allowed to pass on to his tenant. As he must also allow any reduction from time to time in the amount of rates, it is necessary in most cases to make a readjustment of the weekly rent paid by the tenant, every six months.

It will readily be seen what a very large organization is necessary to control large estates, particularly when it is remembered that I have something like 30,000 tenements (families—Editor) under my control. One of the first things I do when acquiring a new estate, is to open a local rent-receiving office and persuade the tenants to make their weekly payments to this office, instead of having collectors call upon them each week, as is the custom generally. An immediate saving is thus made, as there are many less rent collectors employed.

By the system of cooperation which is encouraged throughout, the tenants having been given a clean apartment in which to live—and, incidentally, I should like to mention here that each room is directly lighted and ventilated from the street or from the yard at the rear—they are encouraged, and do react, so far as keeping the apartment clean is concerned. It has been found that by giving the poor class clean accommoda-

* *Local taxes.—Editor.*

tions to start with, they are less inclined to damage that apartment and make it filthy, than is the case in dilapidated property in which the owner takes very little interest, so long as he can get as large a rental as possible.

Notwithstanding the cost of bringing the apartments into sanitary and good decorative condition, it has been found that by dealing with the subject on a wholesale basis, expenses and overhead charges can be very considerably reduced. Of course I employ direct labor for carrying out the repairs and maintenance. I have found it possible to provide a 5-room apartment, decorated as before described, in a working-class district, at a rental of \$3.25 per week for the 5 rooms, inclusive of all charges. This rental is very much lower than the rent which is demanded and paid for tenements which are really slums, adjacent to the blocks that I control.

Here I should mention that there are no bathrooms, in most cases, or hot water; they are walk-up tenements. There are many bath-houses in the district run by local Councils, and central heating is not considered necessary in London, particularly for this class of tenements. Most tenants have a gas range or cooker which they hire from the gas company. The gas consumed and the electric light or gas used for illuminating purposes is provided by the companies direct to the tenants, and is not included in the rent mentioned, except so far as it applies to the lighting of staircases and entrances.

Every apartment has its individual toilet and larder.

In my view, this class of reconditioning, so long as the houses are structurally sound, can be carried out in any city, if done on a sufficiently large scale. Very large dividends have accrued to my shareholders—so much so that I have now found it possible to introduce a welfare department, and have already started building community centers on each Estate, where I hope to take care of the children, educate the mothers, organize clubs for the tenants generally, and do such other work, with the help of a matron on each Estate, as will continue to improve the old districts of London and make good citizens of people who at present awaken in the morning to sordid surroundings.

WOULD THESE LONDON METHODS SUCCEED IN NEW YORK?

That I might incorporate in this paper an authoritative estimate of the possibility of applying these London methods to slum improvement in New York, John Taylor Boyd, Jr., who, in association with Arthur C. Holden and other architects, has been studying New York's housing problem, has been good enough to prepare a special memorandum for me, from which the following paragraphs are quoted:

The idea of solving the slum problem by salvaging the slum buildings is not new. Indeed, the possibility of rehabilitating New York's old tenements has long been studied by experts. Interest in the proposal

culminated in 1920, with a noteworthy public competition, carrying big prizes for the winning architects, for the best designs submitted for improving a city block of old-law tenements. The competition was held under the auspices of the Joint Legislative Commission on Housing and Reconstruction of the State of New York. A full technical account of its results, together with a comparison of the prize plan with a scheme for reconstruction with new buildings, designed by Andrew J. Thomas, will be found in the *Architectural Record* for November, 1920. The competition failed completely in its object, and as a result of this competition the proposal to solve New York's slum problem through rehabilitation of slum buildings was dropped once and for all. Nor has the New York State Board of Housing since revived it.

"But why," someone will ask, "won't the idea work?" High cost of labor is the answer. The labor expended in alteration work is tremendous. Its cost is so great that, since the war, new buildings may cost less than salvaging a structure that originally was jerry-built.

Another factor to be reckoned with is the remarkable progress in architecture in recent years. It has made the plan of old buildings more obsolete than is generally realized, and has caused their operation cost to be high in comparison with new structures. Hence, in many cases, it is not financially feasible to bring an old building up to date, because to do so would require basic changes in plan. This puts a premium on new construction.

The conclusion of experience is that only under exceptionally favorable conditions is there hope of success in rehabilitation. In any case, there is danger of creating serious popular misconception of housing policy if responsible authorities encourage the idea of

rehabilitation as the solution of the problem of slum improvement and low-priced housing. Big-scale construction of new buildings is the best answer.

Although in this memorandum Mr. Boyd emphasizes the impossibility of solving New York's housing problem by any wholesale reconditioning of the so-called "old-law" tenements, he would favor, I am sure, every practicable effort by private landlords elsewhere to modernize houses worth saving, and to prevent "near slums" from becoming unfit for human habitation.

CONCLUSIONS

Neither by private effort alone nor by public action alone, can American cities hope for salvation from present and future slums.

Until the millennium arrives, private effort will need the compulsion of law, the results of systematic research, and the stimulus of organized public opinion, for an effective attack on problems of slum improvement and low-cost housing.

The compulsion of law should include city planning and zoning ordinances, housing acts, building and sanitary codes, and restrictions on density of population—all of them much more drastic than now exist in most states and cities.

Such enactments—if properly drawn and enforced—would hasten the reconditioning of houses worth saving, the demolition of unconvertible slums, and the building of modern, sanitary dwellings of sound construction and with ample open spaces.

Public effort has opportunities for increased service, also, in the beneficial effects on slum improvement and

slum prevention which come from street paving, street widening, the installation of sewerage systems, and the educational activities of fire and health departments.

Greater efficiency of organized civic effort is needed to the end that hard-headed complacency and capital seeking investment and philanthropy seeking a constructive outlet may come to realize—more generally than at present—that improvements in the housing of the lower-income groups of our cities are economically possible and of fundamental social importance.

There will be general agreement, I believe, in the soundness of the conclusions stated in the six preceding paragraphs. It is safe to say, also, that conservatives in increasing numbers are joining with the liberals in advocating exercise of the power of excess condemnation in street-widening projects, and perhaps in giving to the limited-dividend housing corporations, under proper safeguards, the right of eminent domain in acquiring land for low-cost housing.

We then come to the moot questions of tax exemption, state credit, and municipal ownership. These are outside of the topic assigned to me; but no discussion of "Slum Improvement by Private Effort" would be adequate without pointing out, as I have done, that public effort of certain kinds is essential to the efficient functioning of private effort. The question of where to draw the line is a difficult one. All—or almost all—of us would draw it this side of government housing. We want our public bodies to stimulate slum improvement and better housing by prohibiting the bad and encouraging the good; but we prefer to leave to private effort—rather than to the state or municipality—the actual building and ownership of houses. We do not favor

public subsidies; but some of us would not be greatly alarmed to see other cities try out the method of taxation of conservative Pittsburgh, whereby all buildings are less heavily taxed in proportion than land; nor would we object to see in Michigan, as proposed by the Michigan Housing Association, a demonstration of whether public funds can be loaned—without ultimate cost to the public—for the building of wage-earners' homes, with success similar to that which California is having in the financing of homes and farms for her veterans by state loans aggregating already more than \$25,000,000.

However our opinions may differ on these moot questions, we can all agree, I am sure, as to the importance of more thorough research into the possibilities of reducing housing costs by economical financing, improved architectural design, better site planning and new methods of construction. Investigation should be made, also, as to the methods whereby workingmen's homes are being built and sold, in certain cities, at a cost much lower than seems possible in other cities. Another fruitful field of research is to study the reasons why cities which have no bad housing conditions—if there really are such—have remained slumless, and the worth-while lessons which other cities can learn from their good example.

By methods such as these it may be possible, without actual subsidy from the public treasury, to bring to our leaders in science, industry, finance and real estate development, a realization of the fact that the making available of decent, sanitary housing for every American family is a problem now receiving but a fraction of the constructive thought and vigorous leadership which its

outstanding importance demands. And we shall go far towards solving these problems if there can be brought to the production of dwellings any such degree of imagination, technical skill and business ability as has gone in recent years into automobile production and other twentieth century business enterprises.

SLUM IMPROVEMENT BY RECONDITIONING

MAXWELL HYDE

Architect

There is now nearing completion on the lower East Side of New York City, Cherry Street near Montgomery Street, an attempt at slum improvement by reconditioning that is interesting, because it seems possible of duplication on other plots in that part of the city.

Mr. William Sloane Coffin, who is furthering this operation, believes that by altering and bringing back these buildings into use, much needed new housing will in no manner be checked; but, on the contrary, this work will demonstrate the value and possibility of developing this neighborhood with modern buildings, and thereby advance the broader proposition.

The result aimed at is not model housing, but a practical demonstration of the possibility of using existing structures, materially improved and rented at a figure below the possibilities of new buildings in this neighborhood.

The history of the four buildings is an interesting one. They occupy a plot 120 feet frontage by 100 feet in depth and are 6 stories high. They were built about 40 years ago as "model tenements" by the housing reformers of that time.

They were an advance over the then commercially-built structures of that time in having the air-shafts open to the yard at the end; in having water closets

on each floor instead of in the yard, one for each apartment; in having a sink with running water in the kitchens; and a window in the public halls on each floor. There seems to have been gas in the public halls but very few outlets in the apartments. There were a few bath tubs in the cellar. The stairs were of iron with slate treads.

POORLY PLANNED BUT SUBSTANTIALLY BUILT

The houses are poor in plan according to our modern standards. The air-shafts are 60 feet deep, 10 to 12 feet wide, narrowing at the yard end and center to 6 feet. The halls are long and narrow and, even with the window, are fairly dark; but the houses were remarkably well built and are today in far better condition structurally than many houses built more recently.

Among the novel features of the enterprise as planned were to be a kindergarten, flowers in the yard, window boxes, mothers' meetings, and cooperation of the tenants in administration. It did not take long for the enterprise to fail. The buildings were sold again and again—always at a loss—and went through a gradual state of degeneration until they finally acquired the reputation of being among the worst houses in the neighborhood—known locally as “The Pest Houses,” on account of the high record of illness among the tenants.

A SCENE OF DESOLATION

When my partner and I first saw them, the job of rehabilitation seemed hopeless; for they were really in an unbelievable condition. Fourteen out of 72 apartments were occupied; much plaster had fallen; plumbing pipes and fixtures had been torn out; the roof

leaked so that water had found its way down to the second floor; the dumb waiters had not been operated for years; the heating plant, which had been installed only to heat the public toilets, had been abandoned; a few of the windows had parting strips and the winds of heaven blew through the rooms; as much as 24 inches of dirt and refuse was found in rooms that had been locked for years.

Even through the great housing crisis after the War, these buildings were half empty. Many houses in this neighborhood are said to be in similar condition—too dilapidated to occupy. The owners, as a rule, have not had the funds with which to repair them. The low rents yield no profit; and the houses stand a complete social and economic loss.

The ideal thing to do would be to tear down such buildings, clear large areas, and erect new model housing. While this has been advocated for years, at the present time it is not being done in the part of the city where it is most needed.

At one time there was a social prestige attached to living in the Bronx but this is no longer so. We have found that many people now living in outlying districts are anxious to come back to Manhattan. Questioning the many prospective tenants who come to see the buildings, indicates that they wish to remain in this neighborhood, often for sentimental or family reasons, and that most of them are ready to accept accommodation somewhat inferior to those of outlying districts rather than be subjected to a long, crowded subway journey daily.

The location of these particular buildings is good. They are within 15 minutes' walk of City Hall, with fair

transportation facilities across town. A great change is predicted for this locality, bordering on the East River. A plan for a river drive is now before the authorities. Shipping now goes to the great terminals; and, as a result, there is less hauling of goods through the streets. The locality seems to be the logical place for apartments of this type.

Originally, the buildings contained 275 rooms; as altered they will have 236 rooms and 72 baths; 24 rooms have been increased in size. When taken over by the present owner, the average rent was \$4 per room per month. The new schedule calls for a minimum of \$7 and a maximum of \$12. The total amount of rent that was being received was \$2,100; the new rent roll will be \$26,000. The land and old buildings cost \$55,000. The alterations, including fees to the architects and builder's profit, is \$85,000—about \$320 per room. The running expense, it is estimated, will be about \$10,000 a year. The operation after an amortization of 4% has been deducted will show a profit of 6% or possibly 7%.

WHAT HAS BEEN DONE

The work of rehabilitation consists of the following:

Complete fumigation; removal of unnecessary fire escapes in the air-shafts which interfered with light and ventilation; the white washing of all walls; the cleaning of windows—this was quite a serious matter as they were so deeply encrusted with dirt that acid had to be used; a portion of the masonry had to be repointed where leaks had developed and all chimneys above the roof had to be rebuilt; the fronts of the buildings

were repainted a cheerful red and striped, and the trim painted green; unnecessary exterior vestibule doors have been removed and the badly worn and shabby entrance doors improved by new moulding, glass, and hardware.

There were practically no structural changes needed except the moving of partitions to form new bathrooms, and the cutting of a few beams necessary to do plumbing work.

The new arrangement of the plan consists chiefly in locating all the living rooms either on the front or on the rear yards, instead of where some of them were before—at the interior end of the narrow shafts. The housewife and the child spend most of the day in this living room-kitchen, and we have placed it where it receives a maximum of light and air.

A new bathroom is installed in every apartment. These have been located on the darkest part of the air shaft, replacing the poorest bedrooms. They have a black and white floor and tile base, and excellent modern fixtures. The kitchen has a porcelain washtub, an enamel sink, an ice box, a new dresser and a gas range. Every room has one electric light outlet with a simple fixture.

Individual letter boxes have been installed in the vestibules and individual bells and door controls for each apartment. The outcome of this last installation, resulting in the closing of the halls and stairs to the casual visitor, is of great value in the administration of the buildings. The dumb waiters, idle for years, have been rebuilt and made to operate. Estimates were taken for installing a garbage chute for each of the buildings, but it was too costly.

A central steam-heating plant has been installed, as well as a central hot water system. Most of the rooms have radiators. The smaller ones are heated from the risers, and while this is not the best practice, economy made it necessary.

The floors, which it was at first believed would have to be entirely replaced, after cleaning and repainting, are quite satisfactory, with the exception of ten or twelve old kitchens that have become so badly worn that they will have to be replaced.

The air-shafts, much too narrow, are being ventilated by means of large metal ducts leading from the bottom of these shafts to the front areas on the street.

When completed, these buildings will be capable of economic administration, will meet requirements of the tenement house laws in every respect, with 85% of the rooms well lighted and ventilated, and about 15% of the rooms reasonably so.

Consideration was given to installing reflectors and prism lights to throw additional light into the darker rooms, but while effective, it was found too costly. The interiors throughout have been painted with carefully studied colors so as to give the maximum of light. Some of the rooms which were so dark that it was literally impossible to see across them, are now attractive livable rooms. Even with the assistance of Michael Angelo, it would be difficult to make the halls beautiful. We are not so ambitious and are painting them in two colors and are installing some electric lights and treating them merely as passages to the apartments.

Changed conditions of food supply, the buying of goods concentrated in packages, the lessening of the garbage problem as compared with 40 years ago, cook-

ing by gas instead of by coal or wood, doing away with the hauling of these materials through the halls, the use of electricity instead of gas or lamps; and, above all, the much higher standard of living of the present-day tenant, create an entirely different situation in buildings of this character. The older generation of immigrants with its low standards of peasant living is dying out. The newer generation has other demands and requirements.

This work demands the serious and conscientious efforts of the owner, the builder, the rental agent, and the architect. Study must be made of each locality as to its requirements and the economic power of prospective tenants. The method of doing the actual work should permit of flexibility as regards decisions and changes, as modifications and changes must be made to meet conditions that cannot always be foreseen. We were fortunate in our choice of contractors who entered into the spirit of the work and assisted in bringing it to a successful conclusion.

Mr. Coffin and his associates feel that if they have demonstrated that buildings of this nature can be successfully reconditioned, they have done a useful and valuable work.

RECENT DEVELOPMENTS IN CONCRETE HOUSES

MASON C. McNARY

Portland Cement Association

Since the manufacture of portland cement in this country is only a little over 50 years old, I suppose we may consider any concrete house a recent one when compared with some of the older forms of construction.

From the beginning of the use of concrete it has been selected for supporting the largest structures in the world, and many of these structures themselves were built of the same material. Its adoption as a material for home building in any great amount came later, but it has shown a remarkable development in the last 10 years, especially in the form of concrete masonry units. Just at the close of the war, this form of masonry material was known to some extent; but we may say its use has increased from practically nothing at that time to a use of 384,000,000 standard units in 1928. Most of these units were used in home construction.

Because of the adaptability of concrete as a building material, we meet it in quite a number of forms and in many places in the modern home. The logical place to begin construction, I suppose, would be at the ground, so the first use will be for the footings of the foundations. Here the concrete is cast into forms in a plastic state and allowed to harden. The foundation walls immediately above may also be cast in forms, but more

usually are built up of precast concrete masonry units laid in cement mortar, which is another form of concrete.

The walls above grade may also be of plain or reinforced concrete, but again more generally they are of hollow concrete units. The roof will be overlaid with factory-made concrete roofing tile or cement asbestos shingles, and a great variety of colors are obtainable in these materials. The exterior surface will be covered with a portland cement stucco, which will admit of an infinite variety of colors and textures.

Around the exterior of the house the walks, drives, steps, and garage floor will be of concrete, and when the house is completed the yard will be decorated with concrete bird-baths, garden furniture, lily ponds and perhaps a swimming pool.

All of these forms of construction just mentioned are more or less familiar, and in a strict sense, are not recent developments. In fact, they have been with us long enough to have suffered from some misuse.

Again starting at the foundation, these walls can be made absolutely watertight if proper precautions are taken. If built of masonry units, the joints should be well filled with a good cement mortar, which will take care of damp conditions in ordinarily well-drained soils. In poorly drained soils the exterior surfaces should have two coats of cement mortar to take care of possible carelessness in filling the mortar joints. If the soil conditions are very bad, a head of water is liable to stand against the wall in wet seasons; to take care of this condition there should be a line of drain tile placed on the outside at the bottom and led to a point at a lower elevation to relieve this head of water.

Dampness in a basement is not always the fault of the wall, but is sometimes due to poor floors. The tendency on the part of some builders is to slight the basement floor by laying a very thin coat of cement plaster over a bed of cinders and calling it a floor. In a wet soil this kind of floor will not do, as it will soon crack and permit water to enter. A good thick floor of dense concrete is needed and also a special treatment at the junction of this slab with the wall will be necessary to prevent water entering there. I am stressing this phase of building especially as I wish to speak later of a modern trend in home-building which will require dry, warm basements.

The exterior walls above grade, if less than 12 inches thick, should be furred before applying the interior plaster. An exception to this rule might be made for warm climates. Furring is necessary, not to prevent a penetration of moisture from the outside, but because all materials conduct some heat and this loss of heat through the walls makes the inside face of an unfurred wall colder than the air in contact with it, which may cause a precipitation on the inside face. The amount of such precipitation will depend on the amount of water evaporated within the house and this in turn depends upon such things as the amount of boiling done in cooking and the amount of laundrying done within the house. Some of our homes show more so-called "steam" on the window panes than others, and moisture on unfurred walls is from the same causes as the steam on window panes. This precipitated moisture on the walls, if visible, is unsightly, and even if not visible, may loosen the wallpaper, making redecoration necessary at more frequent intervals.

The exterior decoration, in the form of stucco, has caused more complaints than any other part of a concrete house, and many of the complaints are just because there are many stuccos, and yet it is a simple thing to get a perfect stucco job, but there are a few rules to be observed. First, the selection of proper materials, and secondly, to have these properly applied. The proper materials, of course, would be those which in themselves are permanent. Properly applied means that they must remain permanently on the surfaces to which they have been applied.

Concrete in the form of portland cement stucco is permanent; it is the same material with which we form streets, sidewalks, dams and foundations for our heaviest structures, and is of the same form as the mortar used to lay up the best masonry work. After the selection of this material it is necessary to treat it properly after its application. In order that cement may properly harden it is necessary to add water, but if we add water and then permit the sun and wind to evaporate it before crystallization has taken place we might as well have thrown the cement away, so it is necessary to prevent this loss of the mixing water by frequently spraying the stucco after it has been applied. Concrete roads are covered with burlap, hay, earth, etc., and kept wet for the same reason.

The ideal surface on which to place cement stucco is a wall of monolithic concrete or concrete masonry units because they are composed of the same material as is the stucco and they will obey the same laws, so that no trouble is experienced with cement stucco over such backing.

But much stucco is placed on frame walls and it is

from such application that we hear the most complaints. Since there is no bond possible between the wood and the cement stucco, we must attach the stucco by some other mechanical means. This is best done by attaching a metal lath to the sheathing by means of a furring nail so that the lath is not in contact with the wood at any point. The openings in the lath must be of sufficient size so that the first coat goes readily through the lath to the backing, completely enveloping the lath which prevents it from rusting. The second coat is applied over the face of the lath so that the result is a reinforced concrete slab covering the entire surface. The finish coat can be colored and textured to suit the decorative scheme. In selecting coloring material to add to this finish coat only pure mineral pigments may be used.

When properly applied, over frame or masonry, portland cement stucco will give a truly permanent and fire-proof coating which will be free from maintenance.

Now let us consider some of the more recent developments in concrete houses, and once again starting in the basement we find more and more attention is being paid to this portion of a home. Since we usually must excavate dirt and erect thick masonry walls around this space, and provide it with a concrete floor, the cost of such space is usually higher than any other in the house, because such a space is considered necessary and sometimes is obligatory by building laws, and because the cost is comparatively high, this space is often made a minimum so far as head room is concerned, and little attention is paid to the provision of adequate daylight. In other words, we have to have this large expensive cubage, but in the past we have made little attempt to utilize it, except for the storage of useless junk and to

pile up less useful ashes until the spirit moves us to take them away.

A modern tendency is to make the space usable in the form of recreation rooms, living rooms or summer dining rooms, and in some instances they have been made the most attractive and most used of all rooms.

In order to add this room to a house it is necessary only to increase the head room and provide more daylight, and make the sidewalls and ceiling more attractive, but such a basement must be dry and healthful and, therefore, more attention must be paid to the details of constructing the walls and floor. The interior plaster on such walls, since they are more liable to be damp than those above, must be composed of materials unaffected by dampness and I know of no plaster except cement plaster which will meet this requirement. Here again we may tint the plaster to any desired color, or it may be applied in a combination of colors to suit the taste.

The advent of oil-heating apparatus, central heating plants and the use of gas as a heating medium, has removed the objectionable features of most basements as living quarters and many of the manufacturers of coal furnaces are now covering them with decorative housings in color, making them quite attractive if they must be included within this new room.

We have been advised by statistical organizations that 75% of all fires originating within a residence originate in the basement, but if this fire could be confined within the basement it would do little or no damage. As a matter of fact, I believe if most of the stuff we keep in our basements could be safely burned in the basement without the trouble to us, it would be a

benefit. But whether the material is valuable or not, a lot of it is inflammable and constitutes a fire menace at all times. If it catches fire, it will most certainly damage a non-fireproof floor above it, and often destroys the entire home by burning through such floors.

There is no doubt that fireproof walls for a home are more desirable than those that will burn. From the insurance standpoint they most certainly are. Is it logical, then, to create a fireproof wall and roof, and place within these, floors and stairs which are inflammable?

The fireproof floor idea is becoming increasingly popular with builders and owners of the more pretentious houses, especially for the first floor; and many have been built with concrete floors throughout. As an illustration of the popularity of concrete floors in residences, I might mention that one of the leading reinforcing steel companies has established concrete residence floor service in 15 leading cities in the United States. When the *Philadelphia Record* built their first model home at Springfield they placed a concrete first floor in it and several of our leading architects have built concrete floors in their own homes and specified them for many of their clients.

This phase of the concrete house is truly recent and the demand for homes which cannot burn in any portion is constantly increasing. In addition to the fireproof feature, there are many other benefits to be derived from a concrete floor in a home. Such a floor will not shrink, warp or sag. It adds stability to the entire structure, and because of its rigidity, prevents many of the plaster cracks caused by shrinkage of other types of floors. It will also be vermin-proof. The surface treatment can be made the same as that for ordinary con-

struction; that is, hardwood or maple, linoleum, all-over carpets, and in addition to these ordinary ways of finishing, they may also be covered with tile or terrazzo, or the concrete itself may be troweled smoothly and stained any color, and may be made still more attractive by waxing and polishing.

I have talked with many prospective owners and have met with some peculiar objections to concrete floors. I am told that they are cold, damp, will produce rheumatism and many other ills. It is usually easy to meet this resistance to the idea by learning that if the objector is a man, that he works in a building which has concrete floors, and which fact had never occurred to him. If it be a woman, I usually find that she invariably patronizes a fireproof hotel and has spent considerable time on concrete without knowing it. Even the dwellers in apartment buildings may raise an objection to the concrete floor in their prospective home after having spent years on this same material without giving it a second thought. The objections to the concrete floor are imaginary but the advantages are quite real.

The installation of such a rigid type of floor permits the use of fireproof partitions, which also are free from shrinkage, and plaster cracks will be practically unknown. Such partition units, if made of concrete, are usually made with a light weight aggregate to reduce the dead load and these will form an ideal backing for decorative plaster.

A concrete house is permanent and fire-safe. If properly designed, the house will be beautiful and livable, the first cost reasonable, and the maintenance nil. I do not know what more one could ask of any structure.

THE HEALTH-GIVING ULTRAVIOLET RAYS

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There are few of us who have not been told by our physician at one time or another to “get out into the sunshine”—advice which was given because the most beneficial rays of the sun could not pass through the ordinary glass of the windows in our homes.

Within recent years, however, science has developed certain kinds of glass which permit the health-giving rays of the ultraviolet family to enter our homes to give us much of the benefit of unobstructed sunlight. Thus we have the assurance that the ultraviolet home is at hand and that our expectation of health, particularly during the winter months when we are indoors so much, is greatly increased.

Now that it is possible to bring natural sunlight into the home by fitting our windows with glass which transmits the valuable ultraviolet, more thought should be given to the importance of utilizing it to the greatest advantage. The home of today, equipped for the benefits of sunlight, should be planned so that those rooms in which the family spends most of its time will have as much sunshine as possible. This is particularly true of the nursery, the living room, and the kitchen where our food is prepared.

The ideal ultraviolet home, I think, would be one in which the conventional order of the present was reversed

insofar as location of the rooms is concerned. I would place sleeping chambers, kitchen and dining room on the ground floor, leaving the second floor for the living room, study, playroom or nursery. By the use of windows and skylights fitted with ultraviolet transmitting glass those rooms in which we spend most of our time would thus have the greatest benefit from the sunlight.

There has been much talk of ultraviolet during recent years and in this process of popularizing a very scientific subject I am afraid the public has become somewhat confused. We have been told of various types of electric lamps for producing artificial sunlight. The merits and dangers of using artificial sources of ultraviolet rays have been argued pro and con until we are somewhat at sea as to what may be accepted as fact. We turn, then, with relief to that inexhaustible source, the sun, which gives us all the benefits of ultraviolet in its safest form.

WHAT ULTRAVIOLET IS

In order that what ultraviolet is may be clearly understood, I may state that it is the name given to a certain part of the radiation which is emitted by electric arcs and all very hot bodies such as the sun. Radio waves, heat radiation or infra-red, visible light, ultraviolet, x-rays and gamma rays from radium all belong to one big family. Physically they are identical, their only differences being in wavelength and certain effects which they produce.

The concept of wavelength should not trouble in the least now that everyone is familiar with radio and with the fact that in order to reproduce a programme being

sent out by KGO, for example, you must tune your set to the wavelength of the radiation which that station is sending out. If we can think in terms of wavelengths of several hundred meters, we can also think in terms of wavelengths of a fraction of a millimeter to which the human eye is tuned, that is, in terms of tiny ripples instead of monstrous waves, somewhat like those which roll up to the shore from somewhere out in the ocean during a heavy storm. Because the eye is tuned to certain of the very short wavelengths we are conscious of light when they are present. When they are absent we say that it is dark.

We cannot see ultraviolet radiation because the eye is not properly tuned for its shorter wavelengths; but if it were so tuned, we should discover that it is composed of a generous assortment of colors differing among themselves just as red differs from blue. I like to think of the different kinds of ultraviolet as invisible colors. The difference between red glass and ordinary window glass is that the former is transparent to red light only, whereas the window glass is transparent to light of the other visible colors as well. Similarly, there are the same differences between window glasses, some of them being transparent to more ultraviolet colors than others. It is very easy to demonstrate this fact by means of a simple ultraviolet spectroscope.

THEIR PART IN HEALTH

Certain parts of the body, such as the skin, are so tuned that they respond to at least some of the colors of ultraviolet. I have left a convenient loophole by saying "at least *some* of the colors," because we do not yet know very much about this subject. We do know,

however, that some of those colors which cannot pass through ordinary window glass are very important from the health standpoint, for in many experiments young animals have developed rickets when kept behind ordinary glass whereas they grew normally when no glass covering was used.

Furthermore, there is a gradually increasing list of diseases, including certain types of tuberculosis, which can be benefited and sometimes cured by exposure of the patient to sunlight of natural quality. It hardly seems necessary to go into this matter any more deeply, for everyone who reads is well aware that ultraviolet therapy is of tremendous importance. After all, why should we be particularly concerned with therapy? That is the physician's business. We want to consider how we can construct our houses so that therapy will not be necessary so often.

We all agree that we need sunlight, and most of us are too busy to spend much time out in the open. We cannot very well remove the glass from our windows in order to let all of the solar ultraviolet in, and therefore we must adopt some new material to replace the old glass. We must have something which is permanent, pleasing in appearance and not too expensive. At present, quartz, which we all know is the most transparent of all available materials, costs too much for general use. Possibly some day it will be within the reach of the majority of us if a method can be found to produce it on a sufficiently large scale. Fortunately, however, we do not have to wait for that time; for already a number of special glasses have been developed. I do not need to go into any description or comparison of the merits of these glasses, for such information has

already been published. It is necessary only for us to know that several of these transmit some of every color of ultraviolet present in natural sunlight. It follows, and indeed has been proved by numerous experiments, that the same kind of benefits are to be derived from basking in the sunshine behind a good ultraviolet-transmitting window as from doing the same thing out in the open.

THE SOLARIZATION BUGABOO

But how long will such a window retain its ultraviolet-transmitting properties? We ask this question quite naturally because someone discovered that after several months of use the glasses were not as transparent to some of the ultraviolet colors as they were originally, i. e., they became solarized. Of course the decrease in transparency was not serious, but somebody else made a suggestion that might lead one to believe that if these glasses depreciate slightly in a month the material would in time be no better than ordinary window glass.

Whoever invented the solarization bugaboo evidently did not know that such processes slow down very rapidly so that after a short time they come to a standstill. In some ultraviolet-transmitting glass, tested from time to time during the solarization process, the tests proved conclusively that depreciation stopped soon after it began. It seems safe to say that any of the better materials offered by responsible makers will give excellent service as long as one cares to use them.

THE BENEFITS ARE DIFFUSED NOT LOCALIZED

Is it necessary to sit directly in front of the window in order to receive solar ultraviolet? The answer is

"No." The ultraviolet part of sunshine behaves much the same way as does the visible part, i. e., it is readily diffused and reflected. It is not at all difficult, by means of scientific instruments, to prove that the solar ultraviolet is present almost anywhere that sunlight is present, unless of course, some opaque material has been placed in its path. After all why should we not expect this when we consider that sunlight has had to travel about 93 million miles to reach the earth? Surely, if the ultraviolet can stick with the rest of the radiation on that long journey it should be able to find its way across a room after passing through the window.

Of course we must admit that diffused ultraviolet such as that to be found in remote corners of a room and such as enters a north window is very much less intense than that in direct, full sunshine. Very naturally this raises the question as to how much ultraviolet we must have. In other words does it pay to use ultraviolet-transmitting glass in north windows or in any window which is not in line with the sun and with the persons who are hoping to receive some benefit from the radiation? So far we have very little information on the amount required, but the question of dosage will be worked out before long. One thing immediately suggests itself as being evident, however, and that is that the amount of ultraviolet required to maintain good health should be much less than that needed to cure. It is the classical idea that an ounce of prevention is worth a pound of cure. It is the same kind of reasoning that tells us that a pile of wood shavings may be kept fireproof by sprinkling it with small amounts of water at frequent intervals whereas a large amount of water would be required to extinguish the blaze if it were burning. I shall be sur-

prised if it is ever definitely proved that the ultraviolet in north light is of no value.

WHY NOT USE THE BENEFITS NATURE GIVES US?

Finally, I want to emphasize the importance of making use of this natural health-maintaining agent. If you were to purchase a parcel of land on which very pure spring water flowed, would you not consider the location of a house with this in mind? If natural gas were available, would you not immediately plan to make use of it for heat and power? Then why not utilize as much as possible of the ultraviolet in the sunshine which is available on nearly every parcel of land? To satisfactorily harness the spring water or the natural gas would be quite an engineering task, but to let the sunshine into the house in all its natural ultraviolet quality is now a relatively simple matter. Windows, for example, can be made wider and higher and can be placed in unconventional locations if doing so will prove advantageous. Particularly would I suggest that sky-lights be used wherever possible, for a few of these could let in more health rays than all of the rest of the windows combined. I believe also that it may be found that the intensity of diffused ultraviolet in a room is dependent on the kind of floor and wall coverings and on the finish employed on tables and other objects in the room.

THE COST OF DIRTY AIR—OR MONEY TO BURN

SAMUEL S. WYER

Engineer

In order to understand the Smoke Nuisance and why we have a smoke nuisance in an age of engineering, it is necessary to consider some of the rapid changes that have taken place in the last quarter of a century. Of all of the coal mined in the United States, 78% has been mined in the twentieth century; of all the electric power generated in the United States, 98% has been generated since 1900; of all the oil produced in the United States, 92% has been produced since 1900.

In general, in the last three quarters of a century we have made more changes in our physical environment than all the changes in all preceding historic time; with the net result that we have changed this nation from a nation of individuals to a nation of inter-dependent social groups with clearly defined duties toward each other.

In the last 28 years we have undergone the most prodigious change in horse power relationship that the world has ever known. At the beginning of the twentieth century we had installed in this country, in round numbers, 70 million horse power of equipment, including the animal power used on the farm and off the farm. In 28 years—at the end of 1928—this 70 million of installed horse power had jumped to 1026 million. Most of this power comes from energy resources.

WATER POWER CANNOT REPLACE COAL

It has been urged by many people that if we would develop our water power resources we could say goodby to the smoke nuisance. That idea comes from people who do not face the facts. If we developed every drop of water power in the United States that can be harnessed—and did that without any regard as to whether it was good business or not to do so—we could heat less than 4% of the houses in the United States. A great deal has been said about Boulder Dam and Muscle Shoals. It would take 5 plants of the size of Muscle Shoals to furnish the power equipment or the power capacity used today in Philadelphia County alone. It would take 10 Muscle Shoals to equal the capacity of the new steam station of the New York Edison Company now under construction in New York City.

We are living in an age of coal. Water power is of consequence; but so far as the total problem is concerned, it can help but little.

At the present time, the water power of this country, in terms of energy used, furnishes 6%; petroleum 26%; anthracite 11%; and bituminous coal 57%. For obvious reasons the supply of anthracite will be less and less each year, so that in the future we shall have to depend more and more on bituminous coal as the main source of our energy.

WHY WE HAVE A SMOKE NUISANCE

Our present civilization is, therefore, not only a civilization resting on coal, but a civilization resting on bituminous coal.

Hence, we are face to face with the Smoke Nuisance—and, face to face with it in a way that is going to require heroic work, if we are to work out a satisfactory solution. The term smoke—as applied in ordinary language—refers to the loose carbon particles floating in the air resulting from the incomplete combustion of a solid fuel. There is no reason at all why with oil or natural gas there should not always be entirely complete combustion.

In dealing with bituminous coal, it is very difficult to handle it without making some smoke. All opinions to the contrary, there is no such thing as a smoke consumer. When the smoke is made, there is just one place for it to go, and that is, out—into the chimney and into the atmosphere.

The way to prevent or curb the smoke nuisance with bituminous coal is to so handle combustion that you will not make smoke. That is the beginning. When we come to the contrast between domestic and industrial use of coal, there are several elements to be reckoned with. First, the chimney on the ordinary house is very much lower than in the average industrial plant, and temperature conditions are much lower.

In residential sections the smoke nuisance comes more from the misuse of coal in the home than in industry. I live within 1500 feet of the main line of the Pennsylvania Railroad between Chicago and Columbus; and by actual count I get much more bituminous smoke from one neighbor who insists on burning bituminous coal than I do from the entire Pennsylvania Railroad. A freight train takes about $1\frac{1}{2}$ minutes to come into the zone and get out, while the neighbor is at it every hour in the day. What we have got to do is to work out a solution for the home problem.

ITS BAD EFFECTS

It is not debatable that smoke has a very direct bearing on health. It increases fog; it intercepts sunlight; it lowers vitality; it induces about everything that is undesirable from a health view point. It may be that we cannot measure the cost in terms of dollars and cents, but on the other hand one cannot measure many health attributes with a direct dollar and cent yardstick, as accurately as one can a lot of other things.

When it comes to the cost of the Smoke Nuisance because of cleaning expenses and depreciation of buildings and similar effects, it is possible to estimate monetary loss. Based on research work done in Pittsburgh by the Mellon Institute, I am satisfied that the average family spends on an average \$100 a year more for house cleaning, depreciation and additional laundry work, as the result of the smoke nuisance.

If we could get a rational attitude towards this problem on the part of the public, we could solve the smoke problem. And it would not cost a red cent; and we would save at least \$60 a year per family on cleaning bills alone. The big problem—except for those limited communities having anthracite coal—is in the use of bituminous coal. One of the difficulties today in New York City is the burning of bituminous coal by people who do not know how to burn it, and burning bituminous coal in equipment designed for anthracite. Pittsburgh for years has had the reputation of being one of our dirtiest towns; but it is not. There are a number of towns in the United States that are dirtier. New York City today is dirtier than Pittsburgh.

PUTTING BRAINS BEHIND THE COAL SHOVEL

If we could get one idea into people's heads, we could halve the smoke nuisance overnight, without spending a dollar for equipment—by merely putting brains on the end of a coal shovel handle. If people burning bituminous coal would merely fire alternately—either right and left or the front half and the rear half—but always leave one-half of the fire bed exposed, it would cut the smoke nuisance in two overnight. It would also make a substantial saving in fuel to the householder.

All the information that we need to solve the smoke nuisance is now available; it is merely a matter of getting that information out into the furnace room.

While district heating plants—under certain restrictions—can do a great deal, unless all the possible patrons in a block can be gotten to purchase heat, the plant is not economical. If it is necessary to build a pipe line in the alley and get as subscribers to the service only every third or fourth house, the radiation losses on the investment become so large as to make the project prohibitive. Notwithstanding that much has been hoped for from heating houses by electricity, the heating of the ordinary average house by electric energy is not yet within the realm of the practical. If we built our houses as carefully as we build a refrigerator it would be practicable.

Three years ago I spent \$900 in insulating a new house. Insulation makes all the difference in the world both in winter and in summer. Incidentally, I washed all the air that goes into that house with a motor-driven washer. The curtains have been up for two and a half

years without dry cleaning. By washing the air—even though you are in a place where you have offensive smoke—you can strain a great deal of objectionable matter out and send that offensive matter out to the sewer without putting part of it into your lungs.

WHY ELECTRICITY DOES NOT REPLACE COAL

It is claimed that by electric heating the problem can be solved. Can it however be worked out economically? An 8-room house requires two things—we have figures on over 200,000 houses in the United States and I am not guessing—25 kilowatts of connected plant capacity, and 62,000 kilowatt hours of electrical energy. Figuring the cost of 62,000 kilowatt hours at nearly one cent per k. w., we get \$620 for the heating bill of an 8-room house. In addition, there is a cost of \$300 per kilowatt of plant capacity for generating, transmission and distribution equipment, which means a \$7500 investment just to get ready to heat one 8-room house. It is obvious from this, that the electric heating of houses is not yet within the realm of the practical.

Another suggestion is to use gas—either natural gas or manufactured gas. Manufactured gas, because of its lower heating value is obviously more expensive. However, it is not feasible to build a central heating station in any community and heat all of the houses from a general plant, because of the peak load situation.

Another suggestion is to use coke. Now, coke is merely bituminous coal that has had the volatile matter taken out by a heat process. In brief, it may be said to be man-made anthracite coal. It can be used in existing appliances without any change in the appliance, provided one can get the right quality and the right size.

The reason coke has not been used to greater extent is due, primarily, to the fact that the coke industry in the United States apparently has not had intelligence enough to prepare coke in a form suitable for the layman's use.

If coke is to be used, it is essential that all of the screenings be delivered with the coke and placed in the bin. Without the coke screenings, the fire cannot be handled satisfactorily; it will either get too hot or too cold. Having the screenings delivered, will do two things. It will lower the price of coke to the consumer, and will make it feasible to have satisfactory service in the home.

LAW MUST FIRST HAVE PUBLIC OPINION BEHIND IT

Then it is urged that smoke abatement may be brought about, in some mysterious way, by passing laws forbidding it. We have tried that on the eighteenth amendment; it doesn't work. There can be no smoke abatement without a live public opinion. Education therefore is the first step. There must be a thorough educational programme before any attempt is made to get regulation by law. After the public is aroused and interested, an ordinance may help.

Let me repeat: The first step in the programme is the diffusing of the facts now available as to what the smoke nuisance is, what the fuel problem is, and how to cope with it, in order to build up a new public opinion, based on facts and not on emotions.

(For the Discussion of this Paper, see page 313.)

HEALTH AND HOUSING

WAYNE D. HEYDECKER

Field Secretary, Regional Plan of New York

When the Committee on the Regional Plan of New York four or five years ago began its study to determine how residential areas should be developed in the New York Region, it was confronted with a lack of standards of density and of use—not merely for residences, but for other structures that come in close proximity to residences. An attempt was made, therefore, to analyze the factors held by the courts to justify the employment of the police power in zoning. Our courts hold that the police power, as is well known, can be employed only to promote and protect health, safety, morals and the general welfare.

The first thing we did was to analyze the problem of density of occupancy—and in particular, residential occupancy—with regard for these four factors.

The New York City Health Department figures showed some interesting contradictions. The sickness rate per thousand from such diseases as measles, mumps, chicken pox, diphtheria, scarlet fever, etc., was much less in the areas where the density was 200,000 persons per square mile than in districts where the density was much lower. Not only that, but the number of fatalities arising from motor vehicle accidents was much less proportionately in the congested areas. The pneumonia and tuberculosis rates showed similar diver-

gencies. A closer study revealed that the East Side youngsters not only do not get hit so often by motor trucks, but, when they do get hit, do not die, to the same extent as others.

This prompted us to make further inquiry of the Health Department to ascertain the reason for this phenomenon. It appears that inherited resistance to disease, inherited stamina, and inherited vitality resulting from a long process of survival of the strongest under bad conditions in older civilizations, have built up a high resistance, or immunity, in the people who have occupied the districts affected. Therefore, in any study of city-wide rates, there must be taken into consideration those factors of racial resistance that are found in certain districts.

DARK ROOMS AND TUBERCULOSIS

In Chicago in 1916 an effort was made by the Commissioner of Health to establish relationship between dark rooms and tuberculosis and similar bronchial infections. Careful measurements of light intensities in several thousand rooms, correlated with the frequency of tuberculosis and other illnesses in those same rooms, failed to reveal what it was expected such comparisons would reveal. Health Commissioner Robertson said of this study:

"So far as our figures are concerned, we can see no way to connect directly high records in the number of tuberculosis cases with high records in the number of interior rooms. No one likes dark rooms, and there seems to be no defense of them, but with the ideas that prevail about germ diseases, we cannot write them down as the chief cause in the spreading of disease."

In Detroit a few years ago Deputy Health Commissioner, W. F. Walker, prepared a series of charts show-

ing the frequency of disease in the various sections of the city. These likewise failed to reveal the direct relationship that had been expected. Certain definite correlations were established, but these were not of primary importance.

Mr. Walker did make an important contribution, however. As a result of studying a number of cases where rickets had occurred in tenement buildings, he ascertained that the average intensity of light within the rooms in which rickets occurred was less than one-half of one percent of the outside daylight intensity at the same time; whereas examinations of numerous other rooms of the same kind—in which light in excess of that average percentage was found—revealed an absence of rickets. No one can say, however, on the basis of Mr. Walker's examinations, that one-half of one percent of the outside light intensity within a room is sufficient to prevent the development of rickets; but it is an indication that may have considerable significance.

HEALTH AND DENSITY OF POPULATION

Medical evidence has in the past generally asserted a correlation of health to density. A comparative study of figures from 71 cities in the United States brought out other interesting facts. Mortality rates were plotted against acreage of parks per 1000 persons, the mileage of water and sewer pipes per 1000 persons, and the area of acreage of parks and streets, and the mileage of streets, with these results:

Park area per 1000 persons apparently does not affect the mortality rate, for there is no indication that the mortality rate falls with increased park area.

There appears however to be a relation between mortality rates and sewer and water pipe mileage. The mortality rate falls as the per capita mileage of water and sewer pipe increases.

The mortality rate falls as the total acreage of streets and parks increases, though it does not vary directly with the presence or absence of parks.

It seems fair to assume, therefore, that the distances separating buildings as shown by the ratios between mileage of water pipe, mileage of sewers, acres of streets and the mortality rate, do affect the mortality rate.

THE VALUE OF LIGHT

An examination made in 1924 and 1925 of a vast amount of medical literature brought out some interesting facts with respect to light. A preponderance of medical testimony with respect to the value of light establishes the following:

That sunlight is one of the most effective bactericidal agents known,

That sunlight carefully administered will not only cure rickets and surgical tuberculosis, but will prevent their occurrence,

That sunlight is a great stimulus to health, causing chemical changes in the skin and blood and increasing cheerfulness;

That the heat of the sun rather than its light is responsible for most of the ill effects noted from over exposure;

That all sunlight acts as a tonic;

That ordinary window glass, filters out or excludes most of the beneficial short ultra-violet rays; but that the lower ranges of ultra-violet

will pass through ordinary window glass and kill bacteria if sufficient exposure is given.

Some negative evidence with respect to the value of sunlight was discovered, but the great preponderance of medical testimony is on the side of its positive value.

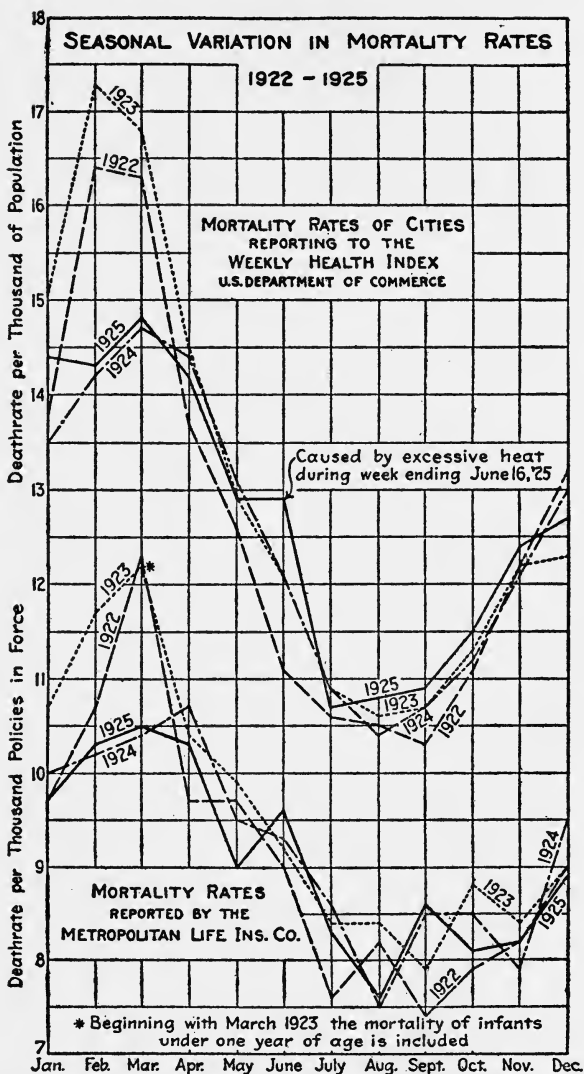
Ventilation was studied to some extent, but the report of the New York State Commission on Ventilation was so conclusive that it was deemed unnecessary to go further. That Report contains several statements of significance to this discussion. The first is, that early sanitarians over-emphasized the importance of pure air and the harmful effects of carbon dioxide; that foul air however does affect the appetite and the work output; that it is overheated air which is really deleterious; that good room ventilation requires a temperature of 68 degrees, or less, without the production of chilling drafts.

Some examination was made as to the restful effects of grass, trees and shrubbery.

The best report on the relation of public morals to overcrowding was written by one of the justices of the municipal court of the city of New York, and published in full in a report of the State Commission on Housing and Regional Planning. This showed a direct relationship between public morals and room overcrowding—a fact which is not news. It also showed a relationship between room-overcrowding and land-overcrowding, which is directly related to the problem of zoning.

SUNSHINE AND HEALTH

The accompanying chart shows the high rates of mortality that prevail during the winter months, and the lowering of the rate during the summer. The upper



Seasonal Variations in Mortality Rates, 1922-1925, reported by the United States Department of Commerce and the Metropolitan Life Insurance Company.

figures are those of the U. S. Department of Commerce. The lower figures are those of the Metropolitan Life Insurance Company, based on its experience with 40 million risks.

The results of an examination of the number of cases of reportable infectious diseases by weeks in the city of New York over a period of 8 years compared with the reported sunshine and recorded temperature in the city of New York during the same period, indicates similar interesting correlations. The total number of reportable infectious diseases rises rapidly at the beginning of each year to a high point in February; and then usually falls off, reaching a low point about September 1st, and rising again in the autumn.

The amount of sunlight available is directly the reverse—low in January, rising to a high point in June and July and beginning to fall off in the autumn. As a matter of fact, there is a lag of about 30 to 45 days between the high point of sunlight and the lowest point in the disease curve, and a similar lag between the lowest point in the sunshine curve and the highest point in the morbidity curve.

The entire field was thus canvassed to determine what, if any, relationship exists between density of occupancy and health and welfare and zoning.

Out of all this mass of material, one fact stands out clearly, the value of light and of sunlight in particular.

How to get this valuable gift of Nature into our buildings is the question. Records of the weather bureau show that the United States is fortunate in the amount of sunlight available. In New York City over a period of 50 years, the sun shone 59% of the time when it would have been possible for it to have cast a shadow.

In Philadelphia the figure was 57% of the time. Just east of New York, on Long Island, we have in the New York Region the high point of sunshine on the Atlantic Coast—78% of possible sunshine, exceeded only by the area in the southwestern part of the United States, near Flagstaff, Arizona, and El Paso, Texas.

Detailed astronomical calculations were made to determine the length of shadow cast by buildings of various kinds, and the area of the sunlight upon the floor of the room through a given window of standard size for each 30-minute interval throughout the day. The details of this study will appear in a Report soon to be published by the Regional Plan of New York under the title "Sunlight and Daylight for Urban Areas." These studies show that it is possible to guarantee one-half hour of noon sunlight, or its equivalent in sunlight intensity, morning and afternoon, in every room of every dwelling 25 feet square, without using more land than is customary in our usual subdivisions with lots 40 feet by 100.

PLANNING FOR SUNLIGHT

As a matter of fact, planning for sunlight, placing the buildings as close together as is possible but guaranteeing sunlight, results in an economy of land use—provided it is done with scientific accuracy. If you try shortcut rule of thumb methods, you will find that they take more land. The question of whether or not the labor involved in any given case is a saving, is determined by the cost of the land.

Different spacings of buildings result from different street orientations; and lot lay-outs must be very different from those to which we are accustomed. Sun-

light planning will result in shallower lots with wider frontages. It necessitates a reconstruction of our ideas as to what constitutes a proper lot-unit, but the fact remains, that it *is* possible to provide sunlight penetration in houses. At the time these studies were made, none of the glasses transmitting ultra-violet rays were on the market. Today there are several.

Further studies were made with respect to the possibility of substituting skylight for direct sunlight or *sunshine*. Records of the Weather Bureau show that there is a great deal of ultra-violet intensity in skylight—more when the sun is low in the horizon—and it was established that for windows facing north, the window area should be increased about 50%. Thus, for example, if we take as a standard a window 3 feet wide by $4\frac{1}{2}$ feet high, we must increase to $4\frac{1}{2}$ feet square the size of the window facing the north, in order to assure to it a skylight intensity over the whole day equivalent in ultra-violet rays to the standard window that gets direct sunshine.

This subject has aroused so much interest among planning boards in the New York Region that two communities in recent months have determined to amend their zoning ordinances so as to guarantee that the window area of every room shall equal 15% of the floor-area it serves. One community is going so far as to require, for every window in a business building, factory or residence, an unobstructed angle of light of 45 degrees from the zenith to the highest obstructing wall.

That, we feel, is progress.

(For the Discussion of this Paper, see page 321.)

HOUSING AND CITY PLANNING

THE OBSOLETE BACK YARD

JOHN IHLDER

Executive Director, Pittsburgh Housing Association

Emphasis has a way of changing meanings so I shall at once put the emphasis where I think it belongs and so let you into the secret that what I am talking about is the *obsolete* back yard. I see a future for back yards provided they are not of the obsolete variety. Of course, I admit that in the future they may be called by another name, for "back yard" now has a bad name so it may be changed to something that will sound, as well as smell, sweeter. But in essentials the re-christened thing will still be a back yard.

Back yards are like other old human institutions in that they have had their ups and downs. Time was when the back yard was the center of the family's outdoor life, as the kitchen was the center of its indoor life. Around it were grouped such points of interest as the woodshed where was always to be found the pliant strip of wood considered necessary in maintaining family discipline, the stable with its dusty and dusky loft, the chicken coops, and—somewhat removed—that little building which at the very first National Housing Conference was styled the "temple of hygiene." In that time the yard was held in high regard; as, witness, the ancient Harvard Yard.

But in later days when we pretended to a greater elegance and gentility—the one-time potency of those

words elegance and gentility it is now difficult to imagine—the back yard like the kitchen fell into neglect. It was indelicate to refer to them. Food appeared upon the table and scraps disappeared. The questions of how and where were not subjects of polite conversation.

Our simple villages and towns had grown into cities. Wealth accumulated and if men did not decay at least they put on front. It was the period of the immortal Oliver Optic, during whose time it became axiomatic that no boy would wash behind his ears or polish the backs of his shoes. For boys were and are the world's greatest imitators and seeing their elders put all their thought upon the front and none upon the rear, they did likewise in their own fields of endeavor.

In those days every man of respectability—another potent word—supported his women folks in idleness and an idle woman was *ipso facto* a lady. And, of course, no lady concerned herself with the menial affairs of life. Such things were the concern of hired help.

In front was Queen Ann pouring tea; in back was Mary Ann pouring slops. It was distasteful to think of their being in any way related. So we didn't think.

The inevitable result of our not thinking was the back yard of the reformer. Once it fell under his eye its career seemed ended. The back yard as he saw it found few defenders. Gone were the days when it was the bright and cheerful center of a family's activity. Deserted except for the scullery maid and the garbage man, it had disappeared entirely from the view of society. To acknowledge acquaintance with it was to acknowledge that one was no lady. It had become the depository of all the unsavory wastes of life. It was perhaps the most nearly perfect expression of the spirit

of a time of pretense when we made a virtue of concealing what we thought embarrassing or ugly, when we dressed women in skirts that dragged in the filth of our dirty streets, covered our ugly mantel pieces and furniture with "drapes" and built our houses with only the thought of making a good show on the street side.

Of course the pretense could not be continued forever. The gossip of neighbors whose rear windows overlooked back yards got into print. Something had to be done about it. The obvious thing to do was to get rid of the back yard.

For years this ideal of the back-yardless community haunted us. Looking out of rear bedroom windows over cheerless areas of warping wooden fences enclosing gloomy rectangles of broken paving or sodden mud, furnished with dented ash and garbage cans and decorated with their overflow, we contrasted this with the comparatively cheerful street vista from front rooms and decided that the back yard must go.

A NEW POINT OF VIEW

It was not psycho-analysts who discovered that desires should not be suppressed. The business man was a long time first in that field. That variety of business man who expands our cities by converting corn-fields into sub-divisions noted this desire for a back-yardless Eden and recognized that the responsibility was his. Not being sure that what he had discovered was a real desire as compared with a passing whim, he was cautious in committing himself and his (borrowed) capital. He began by experimenting with hedges in place of board fences, then he progressed to wire fences and made them lower. He began to see and draw the attention of

prospective purchasers to the beauties of an unobstructed view along the length of a whole block; beauties sadly marred by old-style house design which retained the ugly and unsavory rears.

Gradually the conception grew of a park-like treatment of the block. One of the way stations in this progress is Forest Hills Gardens on Long Island where the private back yard is combined with a private park in the middle of the block. Like many tentative, half-way measures I believe this particular combination was not very successful. For one thing the central park areas were not large enough. But it was an interesting experiment and deserves more study than has been given it.

The conception of park treatment caught, however; and cautiously, step by step, the sub-dividers applied it. Roland Park and Guilford in Baltimore, the Country Club District in Kansas City, Wesley Heights in Washington are a few among many examples of the appeal it had—a whole area planned and built for beauty and comfort. No wonder statistics showed our suburbs developing at rates many times faster than old central cities. In these developments the words “back yard” were forbidden. But in most of them there still remain private holdings.

And in many of them the house underwent such changes on the sides and rear that even a lady of the past would have no reason to avert her eyes.

It remained, however, for the most recent sub-dividers, like those who have created Greenway Parks at Dallas, Texas, to take the final step and practically abolish individual holdings. With this they have incorporated a number of other ideas with which we had been playing, such as turning the houses around with their backs to the street.

A PASSING PHASE

Believing as I do that these most recent developments mark a passing phase, that in a few years we shall have reached a point in our spiral advance, above the one we occupied when the disreputable back yard caught the eye of the reformer, I also believe that these more recent developments are making valuable contributions. It takes a drastic change to shake us free from small abuses to which we have become accustomed, to make us accept as incidents, minor changes that taken by themselves are serious obstacles. So, as incidents to the temporary abolition of the back yard we are doing away with accumulations of garbage and rubbish, with piles of ashes, with board and tin garages.

Taking these things all together they incite us to remodel our house. And in remodelling our house we are taking account not only of the obsolescence of the old-fashioned back yard, but of the changed character of our residence streets due to automobile transportation.

It is curious how prone we are to forget or to ignore inter-relationships—to forget that one change is so largely dependent upon other changes that an old abuse will continue indefinitely unless some related factor is altered that puts it into a new relationship.

Some persons seem to believe that the causes of their obsolescence are immediate and that they affect only back yards, the disappearance of the woodshed, the stable and the toilet. Yet these themselves are only incidents to greater changes which have affected much more than the yard. Use of coal and gas and oil has done more than abolish the woodshed. Perhaps it has

been one of the factors underlying our new philosophy on the training of children. If the rod is no longer convenient, we cease to use the rod.

THE INFLUENCE OF THE AUTOMOBILE

The substitution of automobiles for horses not only has changed our streets from desirable to undesirable frontages; but, in a brief span of years, it has made the country accessible. And then, because of its crowding numbers, has made the country inaccessible. It itself has been changed from a joy-riding "pleasure car" for evenings and Sundays into a work day utility. And, by being so changed, it first made the private garden seem needless and now is making the garden increasingly desirable as a refuge.

One of the—what seem to me fumbling—attempts to cope with all these changes is the proposal of a mid-western builder to abolish the back-yard by placing the house on the rear of the lot. As he develops his scheme he incidentally expands the alley into a street and shrinks the street into a path way. By placing all his yard in front and bringing it thus into public view he hopes to transform it into a thing of beauty. If the motive upon which he relies, desire for public commendation, or fear of public condemnation, is the only one, or the best one, perhaps the great expense would be justified. Yet could not the same results be more cheaply attained by merely turning the house around and presenting its back to the street instead of by moving it?

That is what the creators of Greenway Parks have done; that, I understand, is what the creators of Radburn have in mind. There they throw all the open

spaces of the block into a Commons which is maintained at the common expense.

Contrasting this with the conditions to which it is offered as a substitute, there can be no choice. It marks progress. And for certain kinds of real estate development, for certain kinds of people, it may mark the ultimate of progress at least for many years to come—to the tenement or apartment house population, for example, which has lost sense of ownership, which shirks responsibility, ignorant that lasting joys are inseparable from responsibility.

THE TURN OF THE WHEEL

But for other kinds of people it is not the ultimate. They shudder at the goldfish-bowl kind of privacy it entails. They admit the merit of its park effects, but say that a home is not a public place and private grounds are not a public park. They want to be able to live out of doors without being in the public view. Some of them even want to work out of doors in old clothes, mess around in the dirt, putter at carpentry or painting jobs.

It is interesting to note how primal human cravings, pushed aside for a time by other interests, reassert themselves. Many of us are old enough to remember the discussion over the disappearance of the fire place, when the stove—and then the furnace—came in. To the preceding generation this open fire had been a necessity, a utility. Incidentally, there had grown up about it associations and traditions that made us regret its passing. We recognized that a valuable intangible was being taken from the home. But being a practical people we resolutely substituted the more efficient stove and furnace.

Yet, we clung to the semblance of what we had discarded, and put in gas logs that imitated it in ghastly fashion. And then, we reinstated the old fire place in its place of honor. Furnaces are more efficient now than they were in the days of our youth, and yet the open fire has come back—and come back as a thing of utility as well as of sentiment, in those first crisp evenings of fall and those last chill evenings of spring when it is not worth while to run the furnace.

So it is already beginning to be with the yard. The hay barn and the stable have disappeared and the garage as a part of the house has been substituted. Gas and oil may make soot but they do not leave a residue of ashes to pile in a corner. The ostensible utility of the yard has disappeared. Yet its real values as a center of the family's out-door life remains. And, because they remain, the yard is coming back, not in its obsolete form as a catch-all for household wastes, but as a garden, as an outdoor living room.

WE STILL SEEK SANCTUARY

The park-like developments are predecessors of a newer form of development where each family will again come into its own. Garden walls and hedges will interrupt block-long views with streams of automobiles on the boundary streets—forming a background. They will call for a higher order of talent if equal beauty is to be secured. But granted the talent, the beauty, the interest, of our future residence areas will be even greater than those now so well advertised. Flowers against a mellow brick wall are more effective than flowers in the open; a tree rising behind a wall is more intriguing, more stimulating to the imagination than is one that stands fully exposed to every passerby.

But it is not alone the passing of the stable and the coming of the garage that have made the change. A more intangible force has been at work.

It is a human characteristic that we progress from the poverty simplicity of gingham gowns through the fussiness and ostentation of furbelows to a new and more sophisticated simplicity. So we have progressed from the enforced privacy of pioneer or rural living, through front porch promiscuity to a new voluntary privacy that has in it the charm of sanctuary from a too noisy world.

So, too, we have progressed from the time when growing things was a never ending toil, through the period when we sought to forget all concern with soil or weather, to this present when we are developing a new and more sophisticated interest in growing things. Of all the recent movements for enriching American life, none promises more than that of the Garden Clubs. I would respectfully call it to the attention of future sub-dividers.

By all means let us set our houses well back from the street and cultivate attractive front yards. They not only are a proper contribution to the community, but they add to family privacy by keeping the house away from the street. But behind the house we shall have the back garden shut in from the public, a private domain where the family may again center its out-door activities. And because of this back garden we shall still further remodel our house. The kitchen and the garage may continue their new habit of opening upon the street frontage, but access from the kitchen to the garden must be easy, for the American family is beginning to eat out-of-doors even when it is not on a picnic.

Perhaps the distinguishing characteristic of the American home of the future will be the way its rooms open out—give access to its garden. If so, the American domestic architect of the future must also be a gardener who will know how to make house and garden one.

For in place of the obsolete back yard is coming the out-door living room.

BUILDING FOR THE MOTOR AGE

LOUIS BROWNLOW

City Housing Corporation of New York

We frequently describe Radburn as "The Town Built For The Motor Age," and it is of this aspect of Radburn that I wish to speak.

A few years ago when I was charged with responsibilities for the management of cities, as City Manager, I used to go home at night after troubles in municipal administration and after being up against some of the things that ought to be changed but could not be changed, and say to my wife, "Oh, if I could ever once manage a town that was planned from the beginning."

Well, I have got my wish. I have been up at Radburn now since March, and we have been building since September. And, believe me, there is just as much kick in the synthetic town as in synthetic gin. We have got along far enough now to see that, while there were many of the old conventions and old things that hampered us, still there were many on which we might rest a weary head. And while we have been carving a town out of what had until recently been devoted to carrots and spinach and other vegetables, we wished sometimes there were some of the old things to anchor to. But there were not.

THE CLASH BETWEEN MAN A-FOOT AND MAN A-WHEEL

The City Housing Corporation in planning Radburn has had in mind a conflict that is going on in this coun-

try the clashes in which are more frequent and more violent than in any other conflict that I know about. I find it more violent even than that between the wets and the dries—far more violent than that between the Democrats and the Republicans. I think it is the greatest clash that exists; and that is the clash between man a-foot and man a-wheel.

Now that is a conflict that in our calmer moments we refer to as the traffic problem. When some child has been run over we get emotional about it and refer to it as “municipal murder.” We erect cenotaphs or white crosses and we say and do a great deal about it. Individually, it depends on whether we are a-foot or a-wheel. We change our minds—as we so quaintly term the shifting of our emotional reactions—just as often as we try to cross a street, whether a-foot or a-wheel. When we are in a car we are sometimes profane about the inconsiderate actions of pedestrians; and when we walk we can hardly find language with which to express our opinion of the motorists.

In building this town for the motor age we are trying—so far as the residential part of the city is concerned—at least to have a haven of refuge where that conflict will be for the time being adjourned.

THE STREET SYSTEM MAKES THE CITY

The most important thing about a town—the cement between its building blocks, the bands and hoops that bind it together; its skeleton and its circulatory system—is the street system. After all, the street system is what makes a city. Without it urban life would be quite impossible.

The surface functions of a street, aside from that of

drainage, are threefold. I am not referring now to other important functions—its undersurface functions of providing ways for sewers, water and other utilities—but merely to the surface functions. Ordinarily, we divide a street and raise a ribbon on either side of it and call that a sidewalk and devote that to foot passengers. Between these two elevated ribbons we have a roadway which we devote primarily to vehicular traffic; thus, we roughly divide foot traffic and vehicular traffic.

But there is another surface function of the street which we have not been able to confine either to the sidewalk or to the roadway, and that is—play. In building for the motor age in Radburn we have tried to separate these functions. Those responsible for the planning have dared to be bold and audacious about this, and have separated these functions so far as its residential sections are concerned.

STREETS AND SIDEWALKS REMOTE FROM EACH OTHER

They have planned a town where there are streets that are motor ways devoted to vehicular traffic. And then, entirely separated from them, are other public ways which are devoted to sidewalks—to foot passengers. The sidewalks do not run along the street at all. They run along the margin of parks and are on the other side of the house from the motor way. The house is between the “motor street” and the “pedestrian street.”

At Radburn we have abolished the back yard and made it the front yard. We certainly have tried to do away with the back door, and we are building houses that have no backs, but have two fronts. Houses with two fronts are not new in America. Down in Virginia

on the banks of the James and the Potomac Rivers the great Colonial houses always were built with two fronts. Go to Mt. Vernon where George Washington lived and you will see that he had one hospitable front for his house that faced toward the river for those who came by boat; and another front for the land, for those who came by horse.

We are trying to have our houses at Radburn face both ways. That has given us some problems. Because, when we abolished the back door and got two front doors; and abolished the back yard and got two front yards, there was the remaining difficulty of where to hang the wash. That is one of those things you get out of a "synthetic" town. We have had many long conferences with all the experts we could gather together, and the problem is not yet solved.

Essentially, this radical change in planning consists of the separation of the functions of the street. It involves a new idea of street intersections and a new idea of the block, of which the intersecting streets become the boundaries.

SUPER-BLOCKS AND CUL-DE-SACS

We have huge blocks—very long, very wide. Most of the checkerboard, rectangular street plans in the United States have intersections averaging about 14 to 18 intersections to the mile. In Radburn we will have 4 intersections to the mile on main motor streets.

These huge blocks, of course, have not enough room around the perimeter for the houses to accommodate the people there; so, the houses are built on "dead-end" streets. That is an awful word. Sometimes we call them *cul-de-sacs*. They are little streets set back into

the interior of the block 200 to not over 375 feet from the motor way. And there that street perishes.

The whole interior of the block is a park. And that park will be common ground. Each house built upon these motor streets has a motor entrance facing toward the dead-end street, and a garden front facing toward a garden, which is private property and will be owned by the householder. This garden gives access to a foot-walk that leads down between the rows of houses to the walk that borders the interior park.

This means that no house will be more than 350 or 400 feet away from a park. While every house has the greatest possible use of a motor car—the garage being an integral part of the house in practically all the houses that will be built—there is also a way for people to come a-foot, if they will; and go a-foot, if they will, without being in any danger from any other person who happens at the time to be using a motor car.

The interior parks of these large blocks, which we call “super-blocks,” are inter-connected by a system of walks with under-passes under the motor ways, so that it will be possible for a child living anywhere in town to go to school, or for any person to visit any other person in the town, without going on a street where there can be a motor vehicle.

That is the Safety aspect of “building for the motor age.” We are bold enough to think that we may even restore pedestrianism to the ranks of pleasurable exercise.

Within three or four months it will be possible at Radburn to walk a mile on sidewalks without stepping down from a curb, or being where a motor vehicle can possibly attack one—that is, without having first gone through a house, and even big trucks won’t do that.

The City Housing Corporation has bought at Radburn two square miles of land upon which to build a city for 25,000 people. And 15 years from now when we have 16,000 or 17,000 people there, it may happen that there will be one boy in the community who will be sufficiently audacious to cross the motor way a-foot. But we are trying to plan this town so that this clash between man a-foot and man a-wheel may not be necessary—a clash which is taking so much of our time and thought and whose casualties run into war figures; whose cost, calculated in terms of delays and loss of time, run into astronomical figures.

Radburn is within a 15-mile radius of Columbus Circle, about 4 miles south of Ridgewood in New Jersey, and 4 miles from the heart of Paterson. On an airline it is 12 miles from Columbus Circle, in New York, and is very near the city of Paterson. Its boundaries are only about a mile from the city limits of that city—a little northeast of it.

Radburn is well within the urban region of New York. New Jersey seems far away to some Manhattan dwellers; but Radburn by air line is closer to Grand Central station than is White Plains; though not by present commuting services. There are now under construction about 180 houses, 150 of which are finished as far as the roof.

In building this town for the motor age we are trying to give the families who will live in Radburn the maximum use and convenience that the motor car affords and yet save for the children and all the members of the family the use of their legs—the opportunity to walk in safety free from the danger of the modern Juggernaut.

HEXAGONAL PLANNING AND HOUSING

NOULAN CAUCHON

Chairman, Town Planning Commission, Ottawa, Canada

I would ask my readers to visualize a honeycomb. Then, in their imagination to extend it out over a large area of country—level or broken as may be—meanwhile enlarging the cells till they are each about 400 feet across. A bath room floor laid with small hexagonal, or six sided, tiles may also serve as a starting point for our study. Imagine the hexagonal lines of the cell walls as streets and the cells themselves as city blocks to contain homes around their edges, as in ordinary city oblong blocks, with a large part of what would under ordinary circumstances be rectangular backyards assembled as a circular play ground in the interior of these hexagonal blocks. (Fig. 5, p. 158.)

Before going into the intrinsic merits of the hexagonal block as to sunlight, air and safety, let us consider the traffic conditions of hexagonal planning as obviating congestion of traffic and thereby of housing. It is by affording greater speed and safety and thereby accessibility to a wider area of competitive home land, consequently at prices enabling good housing for the poor, the poorer and—we hope also—for the poorest, that hexagonal planning claims the attention of the sociologist. It is always my contention that town planning is the technique of sociology—which means ultimate human efficiency and the good of all.

While hexagonal planning by its zig-zag roads and streets affords the greater speed with safety, making

time-distances of shorter interval and lower fares over greater areas of accessibility for housing workers, it, at the same time, brings more amenities to the living conditions of all—be they in comfortable circumstances or otherwise.

The crux of the traffic solution in hexagonal planning is, that over the greater area of a city—which is always for residence use—the streets meet in three-way junctions, and not as cross intersections. Cross intersections cause the holding up of traffic on one street while it is moving on the other—i. e., a theoretical efficiency of 50% at the most, which in practice rarely amounts to 30%. Where streets meet at three-way junctions, traffic forces are deflected, instead of interfering as they do at cross intersections. Then there is the visibility of the wider angle of approach at a three-way junction which obviates such frequent slackening of speed as is entailed for contingent safety at cross intersections.

If in the light of the foregoing one looks upon a field of hexagonal planning and runs his eye along one of the zig-zag courses in any continuous direction, it will be realized that, what at first sight seemed so resistant to penetration, is really a very fast and easy route of great visibility, almost free from interruption.

Having submitted these factors which insure such speed and free access to home lands, let us examine the intrinsic merits of the hexagonal block, or “cell,” as a residential form.

The hexagon approximates the beneficial properties of the circle—the most economic geometrical form for contents—and the advantages of straight courses for service mains. There is 10% less street required around it to render the equivalent services that is incumbent

upon the ordinary rectangular block form of equal area—an enormous saving of public and private funds.

By pointing the hexagonal block north, all direct east-west streets are obviated and the sunshine—even in winter when most required and valuable as a sanitizing agency—can penetrate for some time each day to all surfaces of all streets, and bathe the walls and windows of all dwellings both on the street and on the courtyard sides. The internal size and width of the inner playground allows the low-angle winter sun to penetrate to the base of all exterior walls. This playground is of such shape and dimensions, and under such intimate house supervision, as to prove most attractive and keep the youngsters off the streets where the three-way facilities of faster traffic maintain the economic advantages of wider accessibility, and by greater competition keeps more home land within reach of those who need it.

There are many other factors of technical and of popular importance exhibited in the organic plan of a city evolved on the hexagonal principle, which require the use of diagrams* for their demonstration and easy comprehension.

To summarize: Hexagonal planning provides swifter and safer traffic and more freedom from accidents; wider accessibility to home land and the keeping of it more cheaply available for the extension of healthy home areas; obviates congestion; provides more “mothers’ parks” and home-supervised playgrounds; gives accessibility of sunshine to every street and external house surface—resulting in better homes, more amenity, more efficiency, more health.

It thus means better business, longer life and happier homes, increasingly for all.

* See diagrams in next paper, Figs. 1-16.—EDITOR.

HEXAGONAL PLANNING

JOHN M. KITCHEN

Town Planner, Ottawa

The ideal form of unit for land subdivision is the circle. But bearing in mind the cost of utilities in the form of street paving, sidewalks, sewers, water mains, service wires, etc., we know that it is not particularly economic to lay sewer or water mains in circles. For the

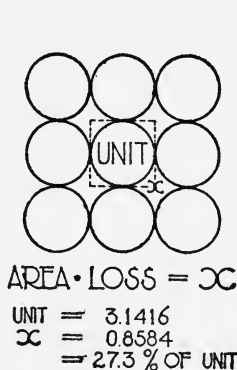


Fig. 1

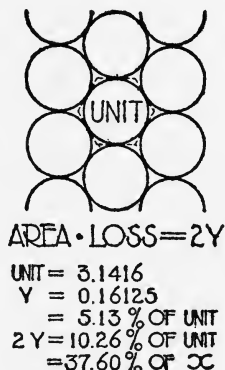


Fig. 2

purposes of maintenance, their installation in straight lines is far more advantageous and desirable.

Having in mind land for subdivision purposes, if we combine or assemble circles in the manner shown in Fig. 1, we have waste areas in the interstitial spaces amounting in each instance to 27.3% of the area of the circular unit. If, however, we assemble these in the manner shown in Fig. 2, we reduce the interstitial waste spaces in

each instance to 10.26% of the circular unit. The circles are now assembled in the most economic manner commensurate with the object in view. The next logical step in the elimination of the waste interstitial spaces, is taken by eliminating them entirely—that is, by forming a hexagonal unit, as shown in Fig. 3.

We have in the hexagon or honey-comb—not only theoretically but practically—the most economic area of least perimeter for use in land subdivision. Fundamentally, this is the basis of the hexagonal theory of land subdivision.

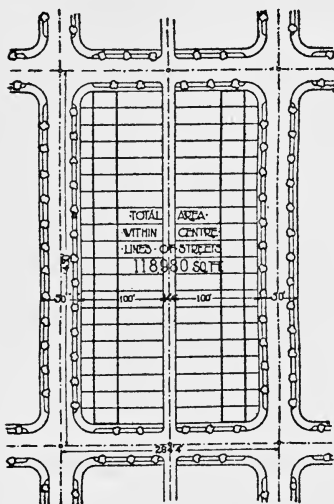
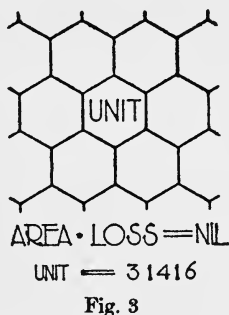


Fig. 4

In the normal rectangular city block, shown in Fig. 4, there are 40 typical 20-foot lots; and the area occupied from centre to centre of streets is 118,980 square feet.

In Fig. 5 is shown a city block of Hexagonal shape. Within it there are also 40 lots of similar width; and the total area occupied is practically the same—118,982 square feet.

A comparative analysis of these two methods of subdividing property will prove both instructive and interesting.

The most important aspect of community life today

is in street traffic. In every city of this country that is the great overshadowing problem in city affairs.

ITS EFFECT ON TRAFFIC

It is appropriate, therefore, in studying these two contrasting methods of subdividing property to consider the question first from the point of view of its effect on movement through the streets.

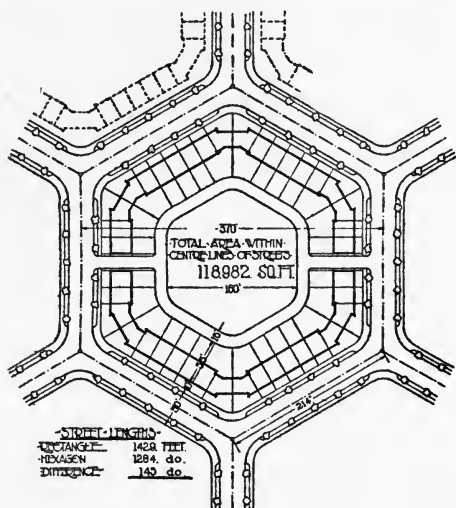


Fig. 5

Under the rectangular block system with its cross intersection of right-angled streets, the streets are but 50% efficient; for, when right-of-way is given to one stream of traffic, the other at right angles is automatically stopped. In practice—due to right and left hand turns and the human elements involved—this theoretical efficiency of 50% is rarely, if ever, attained; it seldom amounts to more than 35%. At each of these

street intersections there is, moreover, a minimum of 16 possible collision points; i. e., points at which one line of traffic crosses another (Fig. 6).

What a different situation exists in the case where property is divided in Hexagonal blocks instead of in the usual rectangular ones. Instead of 16 possible collision points, there are but 3 (Fig. 7). Here the flow of traffic across the intersections is not of direct interference of traffic lines, but

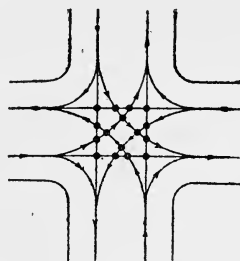


Fig. 6

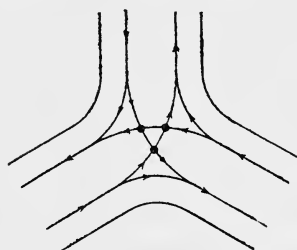


Fig. 7

rather of contact of one line with the other. Where streets thus meet at three-way junctions the lines of traffic-flow are deflected; whereas, at straight cross-intersections their effect is necessarily that of direct interference with each other.

Furthermore, the increased visibility of the wider angle of approach in the three-way junction permits a motor driver as he approaches the

point of junction to perceive a similar approach occurring upon the other streets forming the junction, obviating much of that frequent slackening of speed that is necessitated for safety at the straight cross-intersections of the ordinary rectangular plan.

SAFETY, VISIBILITY, DIRECTNESS AND SPEED

In this speed-mad age, quickness of travelling has become all important. From the point of view of speed

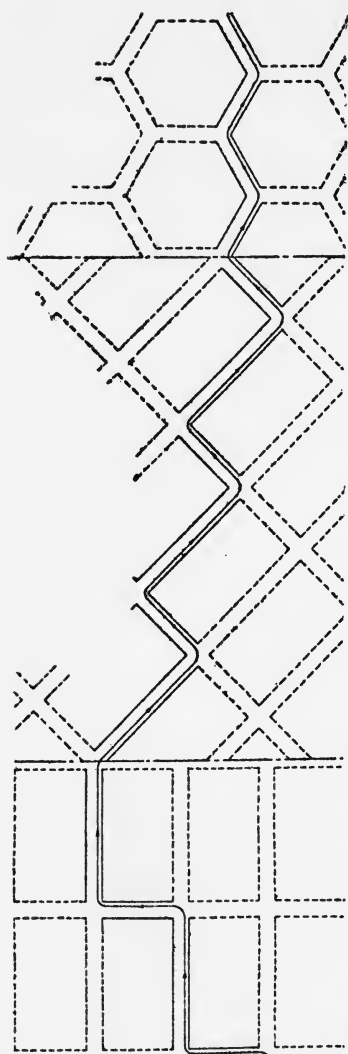


Fig. 8

and directness, the Hexagonal block method of subdivision has distinct advantages.

In the lower part of Fig. 8 there is shown an area laid out in the usual rectangular fashion. Upon this is indicated the line of travel that would be followed in travelling this area in a general diagonal direction. Speaking mathematically, this involves the covering of a distance equivalent to the sum of the two sides of a triangle of which the diagonal distance is the hypotenuse. By tipping up this diagram (Fig. 8 centre) it becomes more readily apparent that any traverse across the typical rectangular area in a general diagonal direction involves the pursuance of a zigzag course—every change of direction in which necessitates a departure of 90 degrees from a straight course.

In traversing a similar

area with a hexagonal layout, however (as shown in the upper part of Fig. 8), each change of direction involves a departure of but 30 degrees from a straight course instead of 90 degrees.

If we superimpose a hexagonal layout upon the usual rectangular one, as is done in Fig. 9, the advantages of the hexagonal layout from the point of view of directness and speed become much more apparent.

By the ordinary rectangular system, to travel in a diagonal direction from A to C involves a distance of travel equal to that from A to G to C. By the hexagonal system the route traversed would be from A by E to C—involving a distance of travel equal only to AFC. This is shorter than the distance involved by the rectangular system by the difference between the distance FC and the sum of the distances FG and GC.

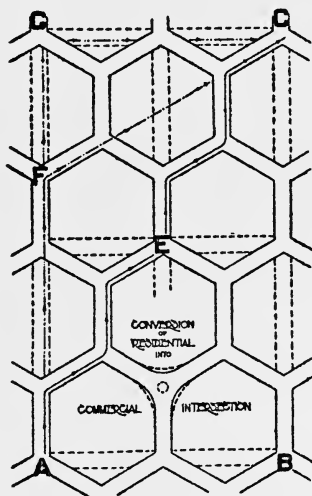


Fig. 9

Furthermore, in the rectangular system in traversing the area in a general diagonal direction, either or all of the following are involved at intersections, viz., the right-hand turn, the left-hand turn, or the straight cross-over. Each of these involves a slackening of speed, incidental to lack of visibility, with every likelihood of definite stops, if the traffic approaching the intersection has not precedence in right-of-way, while the left

hand turn involves an indirect cross-over in every instance.

In the hexagonal system, however, at alternate street junctions there is no interference from the right, and the wide angle of visibility is such as to allow speeding up in adjustment to any traffic coming from the left. And it is only at intersections intermediate thereto that positive interference can occur; and here the wide angle of visibility lessens the degree of speed adjustment or interruption.

COLLISION POINTS

A comparative analysis of traffic interferences over a stated distance is presented in Fig. 10. As already

COMPARATIVE ANALYSIS OF TRAFFIC INTERFERENCES

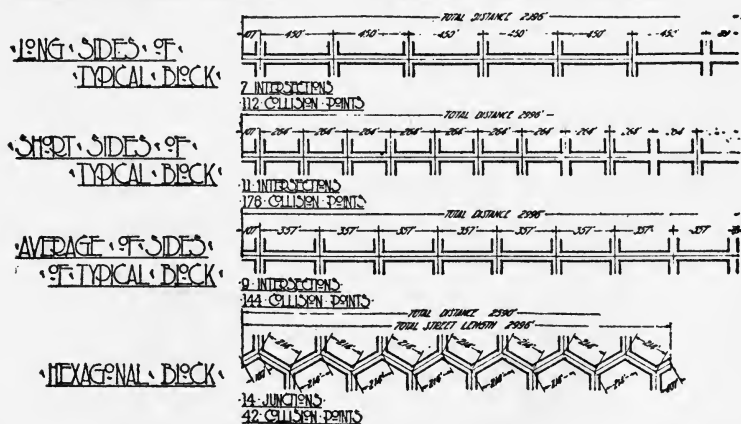


Fig. 10

pointed out, there are 16 possible collision points at a straight through-intersection, and but 3 at a three-way

junction. In traversing in a straight line a street contiguous to the long sides of the blocks in such a rectangular subdivision, in the distance of 2996 feet involved one crosses over 7 intersections, involving 112 collision points. If the street traversed is contiguous to the short ends of the blocks, 11 intersections are crossed, involving 176 collision points; that is, under the rectangular layout there is an average of 9 intersections and 144 collision points.

In striking contrast, under the hexagonal system a journey through a similar length of street involves but 14 junctions and 42 collision points.

It is not mere distance alone, but the element of time involved through distance and traffic interference, i. e., "time-distance," that is the basic factor in the determination of the economic distance between home and work.

Where the distance to be travelled involves an excessive expenditure of time, the general tendency is to overcrowd such housing areas as are reasonably contiguous to work areas, with concomitant street congestion resulting ultimately in slums.

Thus far we have considered the advantages of the Hexagonal Block system chiefly with regard to its effect on street traffic.

It has many other and more direct benefits. As compared with the usual rectangular block system, there is a saving of 10% in the cost of street grading, street paving, sidewalks, street mains and local frontage improvements generally.

In the ordinary rectangular block shown in Fig. 4 the length of the streets surrounding it is 1429 linear feet. In the Hexagonal block enclosing a similar area of land (Fig. 5) the length of surrounding streets is but 1284

feet—a difference of 145 feet, or 10% less street and local frontage improvements to pay for.

THE HEXAGONAL SYSTEM MEANS MORE SUNLIGHT

In addition to these economic advantages, the social advantages of the Hexagonal system are very great. One of the great drawbacks of the ordinary grid-iron or rectangular plan is that half the streets are east and west streets with half the rooms having only northern exposure, and are consequently deprived of direct sunshine. This is particularly objectionable in northern latitudes, especially in winter.

In striking contrast, the Hexagonal system, where the blocks are oriented with their peaks pointing north and south (as in Fig. 5) by reason of the non-conformity of the direction of its streets to the cardinal points of the compass, not only permits but ensures that the low-angle winter sun shall penetrate to the base of all exterior walls, and to all windows, both front and rear, for some period every day.

VISTAS ENCOURAGED

In addition to this great advantage of the Hexagonal system from the health point of view, there are architectural and æsthetic gains that are not lightly to be dismissed. At the ends of the ordinary rectangular block there exist end lots or lot flankages which wastefully occupy valuable street frontage and do not readily lend themselves to æsthetic treatment, even when the block interior between houses is developed as a playground.

In the Hexagonal block system no such wasteful flankages occur. The frontages at street intersections are fully utilized, and with simple architectural em-

bellishment are susceptible of fitting treatment as termini to street vistas. The Hexagonal system lends itself to street vistas. The rectangular system discourages them.

While the interior of the block under both systems is susceptible of treatment as a playground space, in the rectangular system it cannot be developed as advantageously, owing to its extreme length compared with its narrow width. In the Hexagonal system this space is of such shape and dimension as to be utilized to best advantage.

A COMPARATIVELY NEW IDEA

While the Hexagonal system of block subdivision is a comparatively recent one, the beginnings of the idea

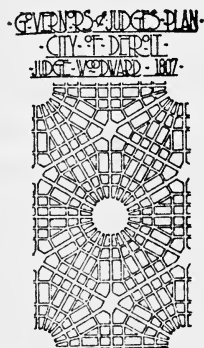


Fig. 11

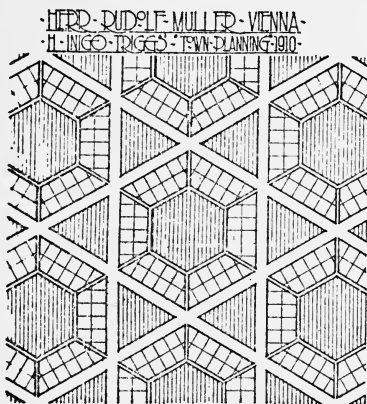


Fig. 12

are to be found in Judge Woodward's Plan for the City of Detroit made in 1807. His plan, however, was basically a triangular plan, and the hexagonal block was purely incidental to it. (Fig. 11.)

Two interesting plans along Hexagonal lines were developed in 1910. Herr Rudolf Muller of Vienna developed such a plan (Fig. 12) which shows recognition of the advantages of the Hexagon, particularly in its provision for light and air, but lacks courage in retaining the straight through-intersection of streets with consequent waste areas and extravagant and hazardous street junctions.

A somewhat similar plan (Fig. 13) was that developed by Charles R. Lamb in England in the same year,

•CHARLES R. LAMB • ENGLAND •
•H. INIGO TRIGGS • TOWN-PLANNING 1910 •

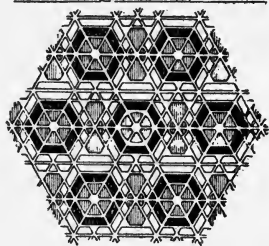
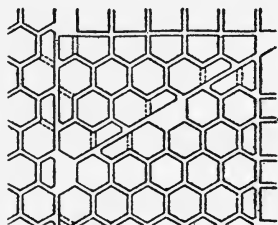


Fig. 13



•R. A. HARTMANN • BERLIN • "STADTBAU" 1926 •

Fig. 14

of which similar criticisms might be made as exceedingly extravagant in the land area actually developed.

Dr. A. Hartmann of Berlin in 1926 sets forth a Hexagonal system superimposed upon a rectangle, in which should be noted an attempt to preserve diagonal directness. (Fig. 14.)

NEW IDEAS ABOUT STREETS

In developing the Hexagonal system the writer has evolved certain new grouping of streets which may not be without interest.

Fig. 15 illustrates these theories as developed in the assemblage of Hexagonal Units and their adaptability

in city development. Four distinct types of streets or thoroughfares are depicted, each having its separate and distinct province in the Unit, while correlated to the whole.

THE "INTERCEPTOR" OR SUPER-HIGHWAY

The "Interceptor" "A" is a grade-separated through highway, having accommodation for a double-tracked radial car-service with rapid transit motorways on each side—having adits "a" and exits "b" at intervals approximating one-half mile apart—and having access to abutting properties totally excluded from it. It is shown in Fig. 15 as surrounding the large hexagonal unit or "Ward."

The principle of the "Interceptor" was originally advocated by Noulan Cauchon on the occasion of the International Town Planning Conference in New York in 1925 when the subject of street widening was under discussion. On the ground that the major portion of street congestion is primarily caused by the intensity of use of the abutting property, Mr. Cauchon maintained that the principle of street widening was in itself unsound.

Street widening invariably results in the encouragement of additional traffic, in further congestion and in more intensive use of the abutting property, following upon its reduced proportions subsequent to the widening. If the principle is sound, in the event of further acute congestion on the street already widened, it is reasonable to pursue the principle again and again, until ultimately there would be wiped out the abutting condition which demanded the invoking of the principle in the first instance.

A street is much like a water pipe. It cannot deliver a flow in excess of its capacity. It is designed on an ulti-

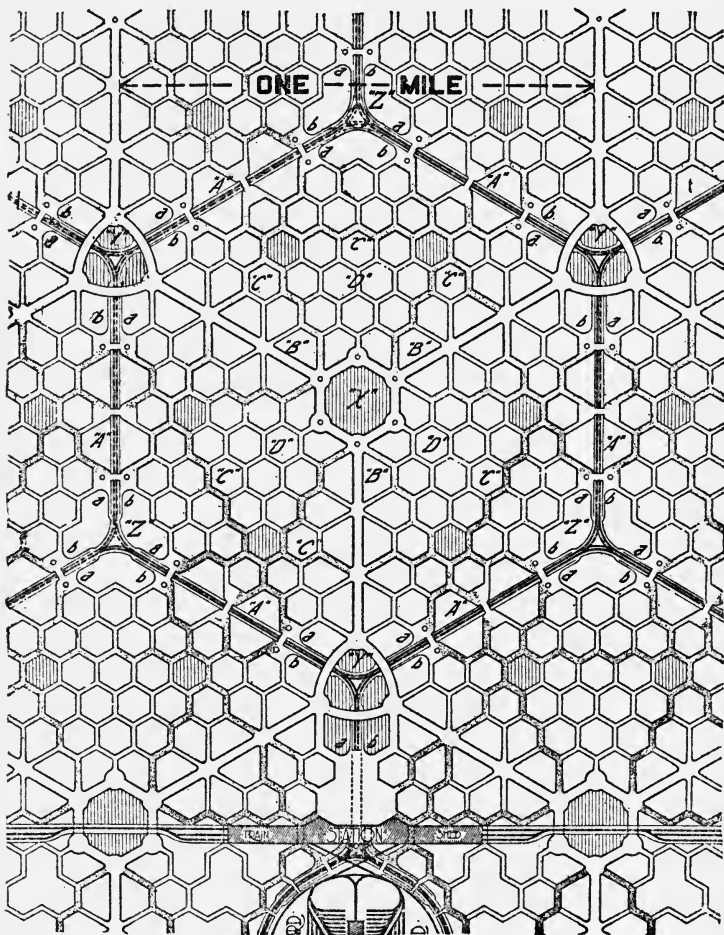


Fig. 15

mate capacity basis. Hence, the "Interceptor," which is designed to accommodate through traffic from point

to point and is not subjected to the stress concomitant to abutting use or local accumulations of traffic.

Why should through traffic be subjected to interruption at intervals of city block length or vice versa, and prevented thereby from speeding through densely developed city areas as is permitted by the "Interceptor"? The "Interceptor" with its half-mile intervals of exits and adits should easily allow a speed averaging 40 miles an hour.

THE BUSINESS STREET

The Business Street, "B" (Fig. 15), is a street 100 feet wide, having accommodation for surface cars, radiating from the "Ward" centre in 3 directions and consequently serving equitably and equally, with fundamental frontage length limitations, the "Ward" area. This "business street," which allows a traffic speed approximating 10 miles an hour, is the only street within the system involving straight through-intersections—a considered condition, predicated upon the fact that, where slow moving traffic is involved, such intersections lend themselves readily to mechanical traffic control.

The centre "X" from which the business or shopping streets radiate is designed as a "Park" centre. It is centrally located as related to the "Ward" unit and to the area of greatest business concentration, and lends itself to parking purposes during the day and municipally organized attractions after business hours. The centers "Y" to which the business streets radiate are designed as "Commercial" centres. They are each contiguous to the "Interceptor" exits and adits—with facilities for rapid and uninterrupted transportation

of goods and intensified daytime traffic. Intermediate to the commercial centres, following the path of the "Interceptor" are the "Institutional" centres, "L" for schools, auditorium, stadium, museum purposes, etc. These, likewise, are close to rapid transit facilities.

MAJOR HIGHWAYS

The Major Highway "C" is a 70-foot highway, shown in Fig. 15 as running from each "Interceptor" exit to an "Interceptor" adit, free from all public utility trackage, traversing through the residential area, and, with the safety, visibility and speed incidental to the hexagonal unit, capable of allowing a traffic speed thereon averaging 30 miles an hour.

RESIDENTIAL STREETS

The Residential Streets "D" comprise the street system furthest removed from streets of greatest traffic density and speed, and allow of speeds averaging from 15 to 20 miles an hour.

Considering the traffic system thus presented as a whole, the procedure, utility and economy of time inherent therein lies.

First, in the use of the "Interceptor" by motor car at 40 miles per hour for the coverage of long through distances; and,

Second, in the leaving of the "Interceptor" by exits immediately contiguous to the major highway, which, traversed at 30 miles an hour gives direct access across the "Ward" area in 6 directions (three each way) to either business or commercial areas, or permits rapid and safe transit to within 2 blocks of the most distant residence within the "Ward."

Referring to the respective types of centres—Park, Institutional and Commercial—it is to be noted that each of these is either central to a “Ward” unit, as defined by the line of the “Interceptor,” or is central to an equivalent and similar area; that they are equidistant, one to the other, and are symmetrically situated in surrounding the residential areas. In other words, the “Centres” of the residential areas are so located as to be in every instance one quarter mile distant from 2 Commercial Centres in their long direction, and a lesser distance from an Institutional Centre and a main Park Centre in the other direction.

It should also be noted that at each Centre the street layout is such that traffic does not concentrate at a common intersection, although it does to a common area, but is diffused or segregated. This, coupled with the generalized commercial, business and residential diffusion already described, ensures more equitable use of and distribution throughout the city area of land and traffic respectively—the whole tendency being one of complete diffusion and not of concentration.

IS THE IDEA A PRACTICABLE ONE?

The question arises: “Will Hexagonal planning ever be put into practice?” It would seem as if this were likely to soon occur.

Barry Parker, the eminent English Architect, who, with Raymond Unwin, was largely responsible for the design and development of Letchworth Garden City, in a Report to the authorities of the City of Manchester, England, declares that the Hexagon as applied to land subdivision is so obviously advantageous in its effect upon road lengths, that one is left no choice in the matter

but to adopt it; pointing out that the cost of land is one of the smallest—if not the smallest factor—in housing, while the cost of road building and public utilities

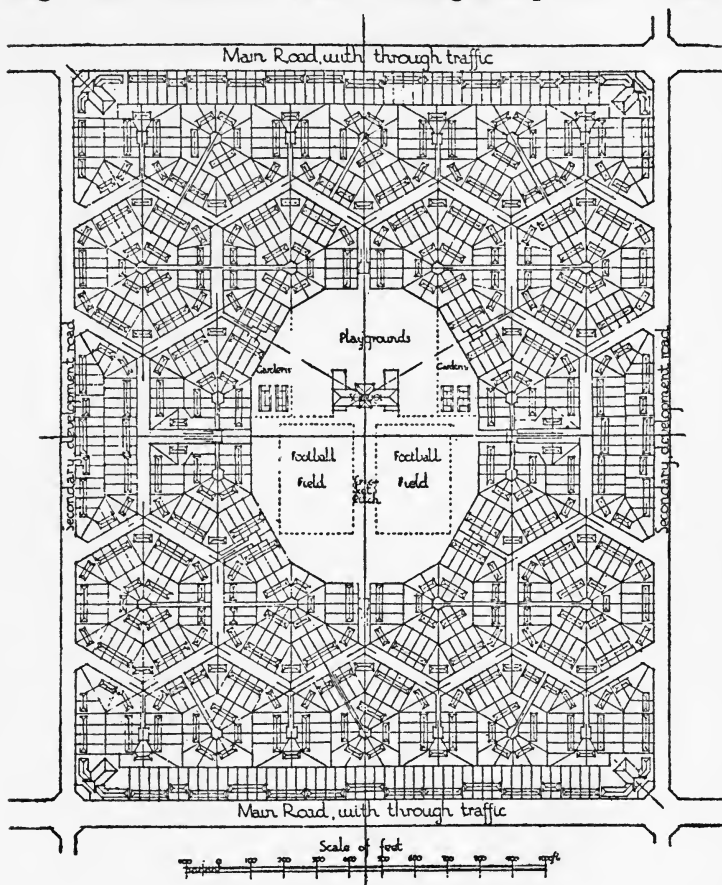


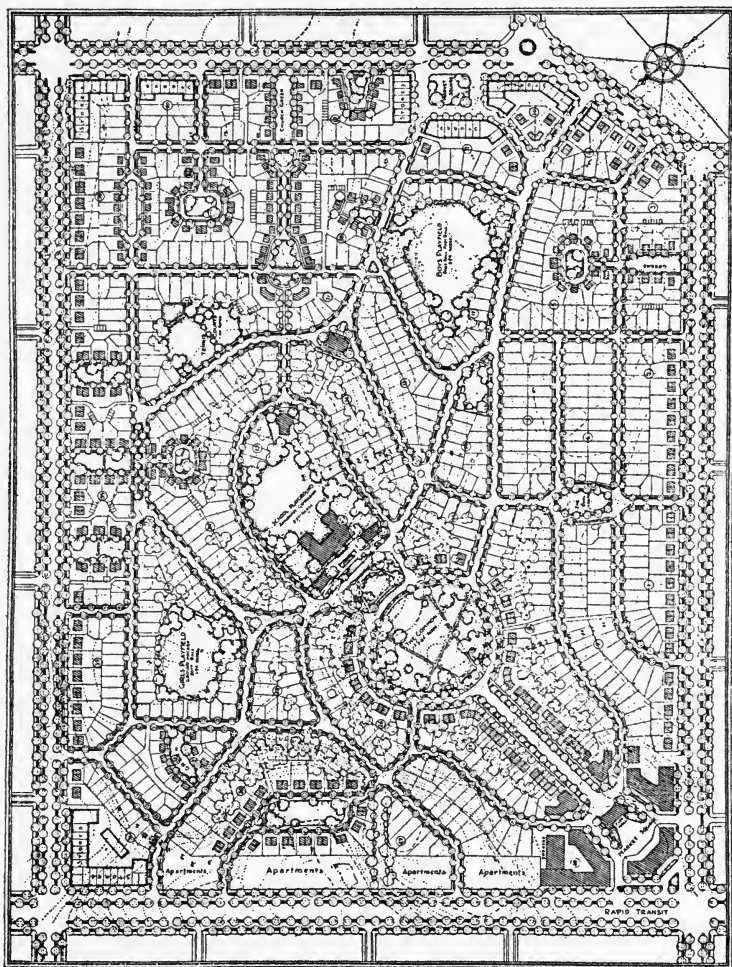
Fig. 16

is unquestionably the greatest; and that, therefore, the more houses that can be built per lineal foot of roadway, the more economical is rendered the housing

scheme. Mr. Parker's adaptation of the Hexagonal system to the Withenshaw development at Manchester is shown in Fig. 16.

THE ADVANTAGES OF THE HEXAGONAL SYSTEM

It is evident that Hexagonal planning provides, to a greatly enhanced degree, rapid and safe transportation with lessened intensity of use and congestion of traffic. This means increased accessibility to areas normally suited to residential purposes and their availability for housing on a basis least subject to competitive values, and most susceptible to the preservation of home amenities.



Proposed Neighborhood Unit

A NEIGHBORHOOD SCIENTIFICALLY CONCEIVED AND DEVELOPED

ROBERT WHITTEN

City Planning Consultant

How can we have a neighborhood with community spirit, civic enterprise and self respect, unless we give that neighborhood a proper physical form and plan it so that it can normally develop those useful attributes?

How can that kind of a neighborhood develop under the ordinary rectangular, standardized street system of our cities, with every block just like every other block—not designed with reference to a particular use?

My attention was first brought to the importance of this subject through the brilliant work of Clarence A. Perry of the Russell Sage Foundation in his studies of the need for a Self-Contained Neighborhood Unit, and the methods by which it could be brought about. Mr. Perry states the principles of the Neighborhood Unit in this fashion:

Our study leads to the conception of a special plan for a neighborhood district. It can be regarded as a somewhat elastic pattern for laying out unit districts in new or re-planned urban residential sections. Its desirable size may be defined in general terms as that populated area for which one elementary school should be provided. In sections where single-family housing is the rule, this means an area of about 160 acres and a population of 5,000 or 6,000 people. It has school and institutional sites suitably grouped about a civic center

and shopping districts at the traffic intersections on its periphery. It is bounded and walled in by arterial highways and enjoys a special street system of its own which provides direct circulation within the unit, but does not invite through traffic through it. The interior is restricted entirely to residential use, and ideally about 10% of its area is devoted to small parks and recreation spaces.

The first requisite of the self-contained Neighborhood is, therefore, the opportunity for personality—for individuality. It presupposes, of course, a general or Master Plan for the entire city—a plan that will leave spaces where these self-contained communities may be built, without having through traffic arteries.

This Neighborhood Unit must have form, it must have limits. It must have some natural boundary such as a stream, or it must be bounded by broad traffic arteries. It must not be divided by any through traffic streets.

THE NEIGHBORHOOD UNIT SUFFICIENT TO SUPPORT ONE MODERN SCHOOL

The Neighborhood Unit must be limited in size and, as Mr. Perry has suggested, the measure of that size is best determined by the population that usually clusters about a public school. The modern public school can take care of a population of anywhere from 3,000 to 5,000 people. This will mean a school population of 500 to 1,000 pupils.

This self-contained neighborhood must have provision for neighborhood stores. But these should not be located where the vehicular traffic to and from them will have to pass through residential streets; they

should be located, therefore, at traffic centers on the periphery, i. e. on the boundary streets.

The Neighborhood Unit must also make ample provision for recreation—both for children and adults. In America, I think, we often overlook the need for recreation space for adults within the neighborhood and near to the homes. We certainly need more tennis courts in neighborhood areas.

Our Neighborhood Unit requires provision for small parks—if for no other reason than to improve the attractiveness and amenities of the neighborhood; to aid in giving it a feeling of self respect; in giving the people of the neighborhood a feeling of pride in their neighborhood.

The Neighborhood must have all the functions and facilities of a complete residence unit; it must have churches, schools, shops, assembly halls, clubs and small parks or commons. It must have a well ordered arrangement of these various functions and facilities, and a local system of circulation that will not interfere with or be incommoded by the general circulation system of the city, or of the Region as a whole.

The local streets, small parks, building lots and buildings, should, in the main, conform to the topography; they should be fitted to the contour of the land, and their location and arrangement should seem to be necessary and natural. The residence neighborhood must possess the natural beauty that comes from private gardens, streets, and small parks, and from the careful preservation in its planning of the scenic beauty and exceptional physical features of its site.

DEVELOPING A 160-ACRE TRACT

Inspired by Mr. Perry's conception of the Neighborhood and of its plan, I had the pleasure, not long ago,

of trying to work out a plan for such a neighborhood, taking a section of undeveloped land 160 acres in extent in the Borough of Queens, in New York City.

A tentative official plan had been adopted for this land which provided for a rectangular street system. I undertook to replan the tract as a self contained Neighborhood Unit. On the new plan this 160-acre tract is bounded by wide traffic streets; no through traffic will be allowed in it. The plan centers the community life about a centrally-located school, auditorium, playground and commons. It locates store centers on or near the bounding streets and provides adequate small park and playground areas.

In working out this plan, one of the problems that had to be considered was whether it was economically feasible to develop a subdivision of this kind for small homes.

CAN THERE BE SUCH NEIGHBORHOODS FOR SMALL HOME OWNERS?

We have many examples throughout the United States of areas of this kind developed for people of wealth—notably, the Country Club District in Kansas City, Roland Park in Baltimore, Forest Hills in New York City, Shaker Heights in Cleveland, and various others. But, it is quite a different problem to provide a neighborhood of this kind for the small home owner.

There is some skepticism as to whether it is practicable to develop single-family homes for the low income classes in our great centers of population. That skepticism has naturally been brought about by the great cost of street improvements, by the increase in land values—and the consequent increase in carrying charges

—that have made it difficult or impossible for the small home owner to continue to own his own home.

The usual development of cities is to begin with the single-family detached house. Most of the lots are built up with such houses; then, as the cost of paving and sewers, and other improvements comes on, the lots begin to increase in value, because of speculative possibilities of two-family houses or apartment houses being built on them. The burden on the small home owner in the form of assessments and taxes increases until he is driven out.

A large part of the financial burden imposed on the owners of single-family homes in this country is the result of unwise methods of subdividing land into building lots, the character of the street improvements required by city standards, and increase in land values, with attendant higher carrying charges and higher taxes. If we are to retain the single-family home as a predominant type of housing in American cities, we must find ways to reduce the financial burden on the home owner.

Assuming that a 160-acre tract of land is to be built up and *permanently maintained* as a single-family section, street and pavement widths of short streets—with no through traffic and serving only as access to the single-family houses fronting on them—can be greatly reduced over the standards now maintained in most cities. The 30-foot or 40-foot width of pavement required by many cities is wasteful; a 20-foot pavement is obviously much less costly. The standard of pavement widths in most cities is predicated upon possible requirements of the future—upon the possibility, in fact likelihood, that the property fronting on the street may

be changed some day to apartment house or business use.

Economies in street and paving costs cannot reasonably be demanded by home owners, unless the character of the neighborhood is *permanently* established as a single-family district. This can be secured by restrictive covenants or by zoning.

In addition to this burden caused by the cost of street improvements, there is the burden caused by speculation in land values and increase in the value of the lots, due to their prospective use for more intensive building development. That, too, can be prevented only by restrictions or regulations that will make the district permanently a single-family house district.

The price that can be obtained for a small house and lot is fixed within fairly definite limits by the income of the typical family that will want a home in that location. The value of a vacant lot suitable for housing purposes is, in general, dependent on the net profit that may be secured by a builder who puts up houses for sale or for rent. If he can build a house with a fair profit to himself for \$5,000 and can sell it for \$6,000, he can afford to pay \$1,000 for the lot.

This 160-acre tract as I have subdivided it is designed for small houses. The size of the lot, the width of the lot, the width of the sideyard and the front yard are all based on the size of the small house that it is proposed to put there. The size of the lot and the size of the house should be in scale. A 40 by 85-foot lot is as adequate for a small house 24 feet wide and 2 stories high, as a 50-foot or 60-foot lot is for a larger house of two and a half or 3 stories.

PARKS ARE PROVIDED

In this proposed plan adequate provision has been made for small parks. This has been done without economic loss. The cost of raw land is as a rule very little. Fortunately, not all land is suitable for building purposes—a great deal of it costs money to condition for building—and can be converted into small parks or playgrounds at much less expense. The experience of the U. S. Housing Corporation in its War Housing work in the development of 128 tracts involving 5,033 acres of land showed that 11.6% of that 5,033 acres was unsuitable for building purposes. That 11.6%, together with 6% more, was thrown into small parks, playgrounds and other open spaces in connection with their housing developments.

In the 160-acre subdivision the bounding streets are 120 to 160 feet in width; they provide adequately for the through traffic of a development of this kind, so that there is no need for running a traffic road through the Neighborhood Unit, itself. All of the local streets are purposely indirect. None of them go clear across the subdivision. Thus, it is not made convenient or easy to use the Neighborhood streets as a short cut.

The central feature of the layout is the Commons, with one or two sites for churches and schools, with the school playground in the rear and an auditorium. There are quite a number of *cul-de-sacs*, or closed-end streets; these give economy in street frontage and give greater quiet and privacy to the homes fronting on them.

There is adequate provision for small parks, with a park in the center and a number of minor parks. There

is also adequate provision for playgrounds and these are well scattered through the district. There are tennis courts, too, so that there is ample opportunity for play and recreation close to the dwellings.

SHOPS AN ASSET

There is a shopping center and market plaza. In the development of a Neighborhood scheme for small houses, it is important to utilize the possibilities of the store locations to aid the financing of the entire plan. They should increase the profit of the entire undertaking. There is undoubtedly a large return from the rental values of stores produced by a population of 5,000 to 6,000 in such a neighborhood, patronizing these stores and spending a considerable portion of their income there.

The streets occupy 27% of the land, residences, 56%, and business but 4%. Open spaces take up 12%. There are seven and three quarters ($7\frac{3}{4}$) families to the gross acre.

Assuming that the Neighborhood is to be permanently a neighborhood of small houses, and that it cannot be changed in future into a neighborhood of apartment houses or business buildings, it is possible to secure savings amounting to about \$371 a lot, as compared with the ordinary standardized subdivision.

THE COST OF STREET IMPROVEMENTS

The cost of street improvement *per lot* under the Neighborhood Unit plan and under the Standard layout may be summarized as follows:

	Neighborhood Plan	Standard Layout
Sewers.....	\$99.26	\$150.31
House connections.....	85.10	111.09
Paving.....	124.09	287.18
Curbing and gutter.....	24.66	73.75
Sidewalks.....	63.35	103.94
Finished grading.....	21.00	32.87
Planting strip.....	17.45	19.72
Grading and planting greens and circles.....	6.24	0.00
Total.....	\$441.15	\$778.86
10% for engineering and con- tingencies.....	44.12	77.89
Grand Total.....	\$485.27	\$856.75

The Neighborhood plan thus shows a saving per lot in cost of street improvements as compared with the Standard layout of \$371.48. This gives a total saving for the 1094 dwelling house lots of \$406,399.

The street improvement cost per lot for the Standard layout is 76% greater than the Neighborhood Plan. The greatest saving occurs in the items for paving, curbs and gutters. The saving here together with that for sidewalks and sewers makes up the bulk of the total of \$371.48 per lot.

A substantial element affecting the cost of street improvements per lot in the Neighborhood plan as compared with the Standard layout is the total street frontage per lot. In the Neighborhood plan the average street frontage per lot in the dwelling house section is 47.2 feet. The average lot width is 37.4 feet so that 9.8 feet of the 47.2 feet of average frontage is due to the side lot frontage of the corner lots and to the length of street across intersections. In the Standard lay out, while the average lot width is also 37.4 feet, the average frontage per lot is 53.7 feet—the additional 16.3 feet

being due to the side frontage of corner lots and the length of streets across intersections. The Standard layout has a frontage per lot 13.8% greater than the Neighborhood plan. This means a corresponding increase in street improvement cost per lot. This accounts for one-fifth of the total saving on street improvements in favor of the Neighborhood plan. This saving in favor of the Neighborhood plan is due to the careful planning of the blocks, lots and playgrounds with a view to economy in the creation of street frontage. Only about one-sixth of this saving in street frontage can be ascribed to the shorter average lot depth—92 feet as compared with 100 feet in the Standard layout.

COST OF THE RAW LAND

The tract of land selected for the Neighborhood study has an assessed value of \$1500 an acre. When this land is ripe for development its present value will probably have increased to about \$3000 an acre. This is a higher acreage value for low or medium cost housing than would usually be found except in large metropolitan centers. Studies of acreage values around 10 cities indicate that tracts of land suitable for this type of development can be secured for from \$1000 to \$2000 an acre.

In the dwelling house area of the Neighborhood plan there are 7.9 house lots to the gross acre. At \$3000 an acre this makes a cost per lot for the raw land of \$380. This cost includes not only the necessary street area but also 17 acres set aside for park and playground purposes. If this park land were not included the cost per lot for the raw land would be but \$333.39.

With the Standard layout and no provision for parks

or playgrounds, there would be but 7.5 house lots to the gross acre and a cost per lot for the raw land of \$400.

INCREASE IN LAND VALUES

Under the Neighborhood plan there would be little or no increase in land values. The housing density being permanently established and the rental limits fixed by the economic status of the population, a lot value much in excess of \$1000 could not be supported. Even though neighboring areas should greatly increase in value with the growth of the community and a generally more intensive use, lot values in the Neighborhood Unit could not increase beyond what could be supported by the rental of a single-family dwelling.

Under the Standard layout and with no restrictions other than zoning regulations on the use of the property, lot values are almost bound to increase with the building up of the tract and of adjacent areas. For the tract in question the zoning regulations of New York City limit business to certain traffic routes but do not prevent the erection of apartment houses. Even before the tract could be considered ripe for the building of small apartment houses, lots would probably have a front foot value of \$100 or more; which would jump the value of the 40-foot lot to at least \$4000. Single family homes for low or medium income families cannot be maintained on \$4000 lots. The taxes and carrying charges are too high.

RELATING THE STREET LAYOUT TO THE TYPE OF HOUSE

In the development of our residence sections in this country, we have hitherto failed to relate the street and block layout to the particular types of buildings that

it is proposed to use on those streets and blocks. It is only by designing the entire Neighborhood with reference to the particular types of housing that is proposed, that savings of this kind can be expected. This saving is very largely due to the narrower roads and narrower pavements provided for such a type of housing, and which are quite adequate for it. It is partly due also to the smaller frontage per lot provided by the Neighborhood Plan, as compared with the ordinary standard layout. Under the Neighborhood plan, the average frontage per lot is 16 and a fraction feet less than under the standard layout; with the consequence that there is that much less of sewers and paving and curbing and sidewalks, which accounts for about one-fifth of the total saving.

The single-family house in the Neighborhood plan while not within the means of the poorest families would be within the means of the very large number of families having an income of from \$1800 to \$2500 a year. The thousands of small houses on narrow lots that have been sold in the Borough of Queens during the last 5 years at from \$4800 to \$7500 shows the demand for small single-family houses. These houses, some of flimsy construction, and all built in monotonous rows on narrow lots, with most street improvements lacking and with no provision for community life or for parks and playgrounds, are but a sorry makeshift as a solution of the housing problem.

HOMES FOR THE LOW-INCOME GROUP

It is believed that the plan outlined shows a way in which a better type of housing without increased cost can be secured for the large number of families of limited

income that in most cities are being housed under conditions similar to those above referred to as existing in the Borough of Queens.

The New York housing law providing for the formation of limited-dividend housing corporations furnishes an agency through which a practical demonstration of the economic and social advantages of the Neighborhood Unit plan for low or medium-cost housing might well be made. In this way it is believed that the building of complete neighborhoods would be shown to be sufficiently profitable to induce the formation of large corporations operating for profit, that would in the future supply the demand for medium-cost housing in complete Neighborhood Units. The large scale operations of such corporations would make possible lower construction and financing costs; and they would have the advantage, also, of a large source of profit in the business frontage values created by the complete neighborhood development.

The Neighborhood Unit plan is one that can be adopted to all grades of housing. It is as well adapted to high-cost homes as to low-cost. The comparison here worked out on the basis of the small 5-room detached house on a 40-foot lot could be repeated on the basis of more expensive houses on 50-foot lots or of 4-room houses on 30-foot lots.

Nor is it to be assumed that any Neighborhood Unit would consist of a single type of house. In the Neighborhood Unit plan here outlined, while two-thirds of the families are housed in single-family detached houses, 19% are in double houses, 3% in row houses and 12% in apartment houses. These proportions should be varied where land costs are different or the income

status of the occupants is different from that assumed here. Moreover, while the 5-room house is taken for purposes of the cost estimate, it is probable that there would be a considerable number of 4-room and 6-room houses in the development.

If the problem were that of providing houses for families with incomes under \$1800 a year, a Neighborhood Unit might be worked out on the basis of 4-room houses on 30-foot lots, and with a much larger proportion of double houses and of row or group houses. Such a development could more properly be considered as a substitute for the tenement in the housing of the poorest families, than could the development here considered which is intended to meet the needs of the \$1800 to \$2500 income families.

In working out this Neighborhood Unit subdivision there was no thought that a plan such as this could be used as a standard for *all* neighborhoods. It was worked out simply to show how it might be possible to lay out a neighborhood of this kind for small homes and provide parks and open spaces, with liberal provision for trees and amenities—and yet do it in an economic way.

THE NEED OF A MASTER PLAN TO GUIDE CITY GROWTH

JOHN NOLEN

City Planner

This term "Master Plan" is a comparatively new one. It is an apt word in many ways; but it means nothing particularly different from the more accepted terms, "general plan" or "comprehensive plan."

Why should a city have a Master Plan? It is a fair question to ask. Other large structures have general plans. Cities have park plans, building plans, school plans, water front plans, railroad plans; but from the large point of view these are only detail plans. Generally speaking, American cities today have not any general plan.

I wonder if it would clarify the matter to think of what would happen with a hotel if it were built without a general plan? Suppose there were independent planning of each floor, without regard to the other floors and regardless of elevators or main halls, etc.?

And yet, a city is built in that fashion. The related sections of its different additions are planned independently. Suppose we had independent planning of the lobby or the dining-room or the kitchen of a hotel without regard to their relationship to each other. Or, let us suppose the plumbing or the lighting or the heating of a hotel were planned independently of each other—without a general control plan.

A hotel has a general lobby; it has rooms; it has halls and elevators. Suppose these did not form a system. Then let us suppose that the halls and elevators were owned by one party, and the rooms were owned by others; that there was no control as to the use that might be made of these different rooms—that they might be bedrooms or factories or stores, or what not. And then, suppose that the hotel was constantly adding to its rooms but had no practical method of enlarging or increasing its lobby or its main halls or its elevators.

One can see the kind of situation that would result from such a method of planning even a comparatively simple structure. In order to carry the comparison one step further, let us suppose that some method of locomotion was invented—let us say some rather simple kind of bicycle—so that one could move around the building pretty freely, through the halls and so on, and one had the privilege of leaving his vehicle at any place that was convenient, parking it as you might say, in the hall anywhere. One can see the kind of confusion that would result. The comparison might be carried still further. Something like that, only many times worse, is what happens with reference to the development of a city or a region without a general plan.

WHAT IS A MASTER PLAN?

Now, what is a Master Plan or a comprehensive plan?

In the first place, it is inclusive. It is synthetic—if that term does not convey an unfortunate connotation. It is extensive, not intensive. It is related. It is in scale. It has a sense of proportion. It is not a detailed plan. We have had detailed plans; they deal with streets or parks or water fronts or zoning by themselves.

Perhaps an anecdote will help to make more evident the distinction between general plans and detail plans. Some one was telling the other day of a man in New York who was not entirely sober and who accosted a passer-by saying "Where am I?" The man replied "You are on Forty-second Street, near Sixth Avenue." "Oh," he said, "cut out the *details* what city is it?"

COMPREHENSIVE IN FIVE WAYS

There are five ways in which a Master Plan is a comprehensive plan. These are the things, I believe, that differentiate it and illustrate its value and indispensable quality.

In the first place, a master plan is comprehensive in the TERRITORY that it includes—it embraces wide areas and not merely parts or wards or sections of a city. It is Regional in character, even though it may not go beyond the city boundaries.

Then, it is comprehensive in the fact that it includes all PHYSICAL ELEMENTS. There are parkways, parks, schools, recreation places, public buildings, business districts, water front regulation, land subdivision, zoning, housing—and not those things, each by itself thought of as solving this problem or that problem, no matter how big it is, independently and separately—they are all fused, always interrelated.

There are problems that are not included in city planning or in the Master Plan. But there is no Master Plan that is conceived which does not vitally influence housing and housing areas. Take the subjects discussed at this Conference, Slum Clearance, New Ideas in Residential Districts, Building for the Motor Age, The Monster City, there is absolutely no solution, or any

possibility of a solution, of the housing problem in the large sense, unless it includes an understanding and widespread application of the idea of the Master Plan.

THE ELEMENT OF TIME

Then the Master Plan is comprehensive in the element of TIME. It is not a day-to-day plan, not a week-to-week plan; it is not a year-to-year plan; it is a plan over a long period. And it is not beginning now and looking forward. It is looking back first to see trends and explanations, seeing what there is today plainly and in scientific terms. It is forecasting, it is looking ahead through a long period of time. If there is one element that explains our municipal situation more than another from the point of view of city planning, it is that failure to comprehend the element of time—to plan ahead.

And then the Master Plan is comprehensive in including ALL SIDES OF MAN'S LIFE. Man is more than bone and muscle; intellect, heart, imagination, emotions, faith are part of him. These needs of the spirit are not met for the most of the people in our country. We have too often failed to protect the amenities, to provide for the most indispensable side of life, for the thing that is the fruit, after all, of our living.

The Master Plan must be comprehensive in that it covers not merely the physical elements, but must include and provide for ECONOMIC, LEGAL AND ADMINISTRATIVE ASPECTS.

DOES CITY PLANNING PAY?

Does city planning pay? That is a practical question that not only will be asked but must be answered. Fortunately, the answer is easy. If there is one argument for City Planning above another it is that it pays.

Does it pay to do things wrong? Does it pay to do things at the wrong time? Does it pay to try to do them ten or twenty years after the time when they should have been done?

And then there is the cost of *not* planning. If you do not plan, you have to pay the heavy bills that are involved in *re*-planning. The Master Plan is the only means by which the rights of property, the rights of persons and the rights of the public can be reconciled in fair and reasonable fashion. Long-term financing, budgeting of capital expenses, as well as annual current expenses, these things are part of the Master Plan.

And all these things, whether it is the territory element or the time element or the physical element or the whole of man's life, or the economic side, it has all got to be fused, to be integrated—one element with another—in a plan which harmonizes and synchronizes the whole of the process.

FOR ALL CITIES

The Master Plan is for all cities. It is for the little city because it is a great opportunity for such a community. It is for the great city because of its great need. It is not made to be executed at once, but is a guide to a city's growth. It is not a pattern fixed for all time, but a living thing—to be adapted to changing needs.

REPLANNING GREAT CITIES

CHARLES W. ELIOT, 2ND

City Planner, National Capital Park and Planning Commission

I have been told that it is a very poor plan to start a speech with a request for sympathy: but that is just what I am going to do. You see by the programme what my situation is. I am far and away the youngest speaker on this programme and I have been listening to one after another of the points that I had so laboriously put down, being presented by Mr. Nolen so much better than I can present them; then I look further on the programme and I see that my boss is going to speak next—it is perfectly obvious that I cannot steal *his* thunder or something terrible would happen.

What I am expected to speak on is the Replanning of Great Cities. Mr. Nolen has told you something about city, state and regional planning, the master plan, and the preventive side of the work.

If city planning can be called the exercise of foresight, it seems to me that replanning should be called the exercise of hindsight. The difference between foresight and hindsight is the difference between prevention and cure. In replanning cities we are interested in the curative side of the work.

We all know people who would gladly join in a hymn similar to the old Moody and Sankey hymn of "Leave the poor old stranded wreck and pull for the shore." A great many people feel that way about our great metropolitan communities. They would gladly say

good-by to them and start new work in some new field—build new ships for new ventures. But we cannot do that.

There are several millions of people who have to live under conditions of city life as they are—whether we like them or not—and whether or not we think we can improve them. I have no sympathy therefore with those people who want to leave the ship. It is a sinking ship, perhaps, but we can do our best to plug up the leaks.

However, there is one lesson to be learned, I think, from people who advocate the horrible example. For, a horrible example does seem to be necessary before we can make the American public—or any other public—take action. There has to be some real hurt—some spur to action—before people will move. There has to be some catastrophe, some awful epidemic, something must go wrong, before people will see to it that things are started on the right track.

The encouraging thing about the modern trend is that these injuries, these spurs to action, in our great cities, are increasing so rapidly that people are really getting concerned about it, they are really getting ready to act; in fact, in some of our great cities, they are acting.

Each one of these different injuries has its own different little coterie around it; a different group, who see that particular hurt as *the* great problem of American life. And so it was that the Housing Conference came into being. So it is that we have people concerned with the traffic problem, or the high building problem, and every other kind of a particular problem. All these people come at this great issue of the future of our cities from their own particular angle.

The interesting thing about it is that they are all

finding out that it is all one problem; and, although they have approached it from a particular point of view, they find that there isn't any use in attacking the housing problem unless they also attack the city planning problem—that it is all one thing. That is the encouraging sign on the horizon.

All these hurts are very directly related. Take, for example, the situation they have in New York City—high buildings going up in the Forty-second Street neighborhood, causing terrific traffic congestion in the middle of Manhattan Island, blocking traffic to the north and south. New York may be said to be going back to the style of the tight waist, which really does impede circulation in the body. While you may admire the beautiful skyline figure of the maiden, you cannot help feeling concern as to her health.

Few realize the very direct relationship of cause and effect that exists. High buildings cause lots more traffic, lots more people to be transported into that vicinity. The result is new schemes for multi-level streets, huge expense for subways; and, before the multi-level streets or subways are built, more high buildings have already gone up so that the new facilities do little good.

This point does not yet seem to have gotten across to the people of New York or Philadelphia—or, apparently, to the people of any other city in this country—that there is a direct relationship between the bulk and cubage of buildings and the transportation and traffic facilities of the city. The same thing follows in other fields. There is also direct relationship between the recreation facilities of a city and the amount of crime in that city.

All down the line there are these direct relationships whether in housing, in traffic, or in those other spurs to action.

Trying to analyze some of these spurs to action and seeking to find what they are doing to our great cities, I have sought in vain in history to find what it was that was the spur to action in the case of Baron Haussmann's great work in rebuilding Paris. One man's guess is as good as another's. Judging by the record, it was partly for military reasons, partly pride, partly a desire for the magnificent, partly the desperate need of traffic to open up the city, and partly health and housing. That is, there were various different spurs to action; but it brought the result.

Perhaps the people of Philadelphia can tell what the direct spur was that brought about the Fairmount Parkway. Was it that Philadelphia had to have a crowning glory to satisfy the people who were to live in Philadelphia? What was the spur? There was one somewhere that finally put the scheme across. It is those spurs to action which we have to analyze if we are to make progress with this work of replanning cities. We want to use these spurs in getting action from our city councils, from our state governments and from the national government in Washington.

Contemplating some of the big things in replanning cities that are happening, such as moving the Chicago River, cutting Kingsway in London, the building of new civic centers all over this country—in Cleveland, in Los Angeles, in San Francisco, in Denver and elsewhere—I ask myself "What does all this activity come from?" I see in it not replanning but only a hopeful sign of the possibilities in replanning. For it is all

piecemeal, not comprehensive planning. It is an attack on some particular problem on this edge of the town, on another particular problem in some other part of the town—very fine in its results and to be encouraged. But it is not replanning.

What we have yet to make people understand in this country is that replanning involves every individual. The man who proposes to build a new building higher than is allowed by the zoning laws puts up what he considers is a convincing argument, that it will bring a great investment into the city, and that he is building a magnificent building which every citizen of the city can be proud of. He does not seem to realize that at the same time he is going to congest the streets in front of him and deprive his neighbors of their rights in light and air.

Either the individual must be led through education to see his social responsibilities or be forced to see them through the power of law. Our task as city planners is to try to get enough people to see it, so that they will be ready to make the few recalcitrants fall in line.

What seems to me to be basically lacking in the replanning of great cities is, first of all, this lack of comprehensiveness which I have tried to point out; and, second, the necessity of a scientific approach to the problem. There are very definite relations of cause and effect, of which we so far know little, but which obviously can be attacked in a scientific manner.

I have a feeling that if the various groups who have these special problems so very much at heart will address themselves to a scientific approach to these particular problems, that, one by one, they might be wiped off the map.

A NEW WASHINGTON—OR REBUILDING THE CAPITAL CITY

U. S. GRANT, III

Director, Public Buildings and Public Parks, Washington

Washington is the National Capital, and so its problems should be sure of the sympathetic interest of all good Americans; but they should be of particular interest to city planners because it is the American city which preeminently enjoys the advantages of having had a logical and wise plan before construction began. Having been given this good start, due to the wisdom of Washington and the competent city planning of Major Peter Charles L'Enfant, the city planning profession must feel a special sense of obligation to see that the President's wish be realized, that our Capital should illustrate the best our civilization can produce and "express the soul of America."

If this goal is attained, Washington will not only be an example to all our other cities and the best possible proof of the value of correct city planning, not only a delightful city in which to live and make one's home, but also the "city beautiful" *par excellence*.

The selection in 1791 of Major L'Enfant to plan the new Federal Capital was one of the constantly recurring evidences of George Washington's wisdom and good judgment. We of the Planning Commission of today, set up as a continuing body by the legislation of 1926, are only attempting to carry out his ideas. Every time

the plan of Washington has been the subject of careful study, the persons making that study have always returned to the L'Enfant plan; and so to make clear our problems of today I have to go back—not to the book of Genesis, nor to the ark—but at least to the year 1791.

THE L'ENFANT PLAN OF 1791

It has been of interest to us—going back over the old plans and reports that Major L'Enfant made—to find that, though he may perhaps have borrowed some of the geometrical figures comprised by his plan for Washington, he actually built up the plan on the topography of the site.

For the old city itself, he selected out of the 10-mile-square District of Columbia that area which was the most level and had the gentlest slopes lying in the triangular peninsula at the confluence of the Eastern Branch—now called the Anacostia River—with the Potomac River. Within this he chose certain commanding points as sites for structures of special interest and for various institutions and public buildings.

On the basis of these selected sites, he laid out a system of north-and-south and east-and-west control lines for his system of streets. Then he joined them directly and the main entrances to the District with slanting or oblique lines, tying them together along the lines of the shortest actual travelling distance between them. These latter lines are the basis of the avenue system of Washington. They may cause the casual traveller considerable difficulty at first in finding his way about, but are actually a very great help in the traffic for those who know the shortest way to go.

His original plan, as submitted, suffered some changes—mostly at the suggestion of the then Secretary of State, Thomas Jefferson—some parts of the avenues were scratched out and removed, and some slight changes were made to reduce their angles and ease the transition from one to another. It may be of interest to compare a rough sketch made by Thomas Jefferson, found in one of his papers dated March, 1791, to show his suggestions for the layout of the public buildings with the quite different one of the L'Enfant plan as finally adopted. Jefferson would have had them arranged side by side in a rectangle along the north bank of the old Tiber Creek, which L'Enfant proposed to canalize and make a lagoon along the northerly edge of his main park axis—the Mall.

Major L'Enfant was very much distressed, as history tells us, by somebody's building a house in the middle of one of the streets that he had planned. Not being able to get this person to desist from his building operations, with that intolerance which some may perhaps say is characteristic of army officers, he went out with a gang of laborers and tore down the beginnings of the house. That got him into difficulty with the Commissioners and resulted in his resignation. As he took his map away with him, it fell to his surveyor, Major Andrew Ellicott to redraft it, and the plan of Washington actually published was based on the latter and reproduced by James Dermott; it is, therefore, generally known as the Dermott map. It was, however, in every important particular the L'Enfant layout.

For many years, of course, the new Federal City was but a small village; and many sarcastic remarks were made about it. It was called "the city of magnificent

distances" and various such names, because the few people living there could not immediately bring into being a great city; but we are today securing the economic advantages of the broad-gauge planning of President Washington and Major L'Enfant.

One of the ways of treating the extra wide streets which he planned—and which were much too wide for a small town to afford to pave—was to pave only a part in the center of the street and plant trees along the sides of the road, and then put in a sidewalk. Inside of the sidewalk a considerable parking space of grass and trees was left to be kept up by the owners of the property; but ensured the leaving free of a broad right-of-way. Thanks to this far sighted planning, we are able today to meet our traffic problems by moving back the curb to a place nearer to the building line—cutting down the outside line of trees and leaving the inside line in those places where two lines of trees have been provided, or planting new trees at the edge of the new curb where this second line does not already exist—that is, for the cost of laying a new sidewalk and widening the pavement. Usually the width so obtainable is at least that of two automobile lanes.

THE "CIRCLES" OF WASHINGTON

One of L'Enfant's rather interesting devices was placing a Circle at the various points at which the crossings of a north-and-south street with an east-and-west street coincides with an avenue intersection. Of these Circles, DuPont Circle may perhaps be best known to those who come to Washington. A traffic count made two years ago showed this to have the greatest steady average flow of traffic throughout the day of any inter-

section. The interesting point is that it carries this with relative ease—in spite of the fact that during the rush hour considerable confusion is caused by one street car line having to move over a short arc against the tide of traffic around the Circle.

These Circles not only provide gyratory traffic facilities—generally recognized now as necessary at such intersections—but they also provide little open park spaces that are pleasant even in the business section, where people in hot weather can rest in the shade of a tree and even enjoy a light lunch out of doors, as well as affording attractive sites for monuments and public buildings.

It is of interest to note that in L'Enfant's plan the city of Washington was to be laid out, not on an axis of a business street, not on a market street or main street, but on two major axes made by a wide park system—the Mall and the ground running south from the White House to the river. His business street was to be a diagonal of that right triangle, named Pennsylvania Avenue. President Jefferson was instrumental in having two rows of poplars put on each side of this latter street, and in old prints of the time we find between these two rows of trees on each side of the avenue a bridle path for persons riding on horseback, showing the traffic importance of this old means of transportation. In time these poplar trees disappeared.

WHY THE WHITE HOUSE IS NOT ON THE AXIS OF PENNSYLVANIA AVENUE

That the White House is not on the center axis of Pennsylvania Avenue is perhaps sufficiently surprising to deserve explanation. Apparently, Major L'Enfant

planned to so place the White House on the center line of Pennsylvania Avenue that it would be in the direct vista from the Capitol; but he planned a house, square in plan, and marked its site by driving a stake for the center of the front door on the north side. When the White House plans were awarded to Mr. Hoban, the winning plans were for a long and very narrow house. After considerable discussion, the Commissioners and President Washington decided to build the center of the front door on Major L'Enfant's stake; and consequently the back of the house did not extend out across the line of Pennsylvania Avenue as had been expected.

The L'Enfant-planned city lies between the waters of the Potomac River and the Anacostia River and extends northward to what he called Boundary Avenue—now called Florida Avenue. Just after the Civil War there was a very great increase of population. In 1860 the population was 61,122; in 1870 it was 109,199; and in 1880 it was double what it was in 1860. But all that had been planned in advance was the L'Enfant plan on the level ground south of Florida Avenue.

The increase of population induced the growth of subdivisions outside of the area of the L'Enfant plan and with little or no relation to the latter. These subdivisions, laid out in accordance with the personal ideas of the developers present a large part of the problems of replanning that we have to meet today. As a result, we have such great avenues as New Hampshire Avenue, for example, ending in a hillside—and having no outlet through the subdivision built there without regard to it. Similarly, Vermont Avenue runs into that same subdivision; and, in fact, many of our great avenues—expensive to pave, expensive to maintain—have no

through-traffic value. It is in cutting through these subdivisions that we are now up against high prices and high costs.

The situation became so serious that about 1893 legislation was passed requiring the District Commissioners to prepare a highway plan for the entire district, and appointing a Highway Commission to act on that plan and give it final approval, also requiring the latter's approval for all changes in it that might be found desirable from time to time. Consequently, by 1894 there was developed a complete highway plan for the entire District which has since been modified as needed.

MAKING CITY PLANNING PAY

Our Commission since coming into office has been giving special study to the question of replanning undeveloped streets that it was still possible to replan. As nearly as can be estimated, the 44 changes made by our Commission up to last summer saved the District about \$500,000 in first cost for roads alone. If the same system of replanning is applied with equal success to the parts of the District where the streets are not yet built up and developed, a total saving to the taxpayers of the District of approximately three and a half million dollars (\$3,500,000) should be possible for reduced initial road cost; and in addition this will carry with it a reduction of about \$325,000 a year in maintenance charges, street cleaning, lighting, police and similar recurring items.

I might say that the resultant economy is beneficial to the developer also. By reducing unnecessary fill, and increasing—in some cases—the amount of land he has to dispose of, the saving to him is very material.

It is a little difficult to find out just what this saving is, because the real estate operators are not particularly interested in the public's knowing exactly to what extent their cost of development has been reduced.

However, that is not the entire problem. To meet modern traffic conditions the city requires now, we believe, a differentiation of streets for different kinds of use. During the past summer the Commission has made a "thoroughfare plan"; that is to say, it has indicated certain streets as thoroughfare streets, considering those the streets that should be enlarged and on which traffic should be facilitated in every possible way, and on which the greatest amount of money should be spent. If the Commission's plan can secure the concurrent action of the District authorities and Congress, it will leave other streets assured the quiet that will make them most comfortable for residential use.

The L'Enfant plan laid aside a large number of areas for city parks, quite a generous amount, but very little was done to improve them until after the Civil War. In 1853 some effort was made to improve two of them, but one can judge of the general country village condition of the city by the statement that after those two parks were improved, it was necessary to fence them in to keep the sheep and hogs and cattle from coming in and eating up the new shrubs. During the Civil War the various parks received hard usage as camps, etc. And it was not until 1867, when the parks were taken away from the jurisdiction of the city authorities and placed under the Chief of Engineers, that their improvement began in earnest.

HOW A RAILROAD MIGHT HAVE CHOKED CITY DEVELOPMENT

An old picture of the Capitol grounds and the Capitol shows the tracks of the Baltimore and Ohio railroad in the street at the very foot of the Capitol itself. The Pennsylvania railroad had similarly been inserted across the Mall with its station in the Mall at 6th and B Streets. In 1897 legislation was proposed giving it permission to build a masonry viaduct across the Mall, which would have made Major L'Enfant's idea of an avenue from the Capitol to the Washington Monument permanently impossible. Colonel Bingham, who was at that time the officer in charge of public buildings and grounds, was very much stirred up over this. He got the old L'Enfant plan out of the files and showed that if the Pennsylvania railroad was removed, it was still possible to carry out the avenue idea of L'Enfant's.

The excitement that was stirred up at that time resulted, with the help of the American Institute of Architects, in the appointment of the 1901 or McMillan Commission, consisting of Daniel H. Burnham, Frederick Law Olmsted, Charles McKim and Augustus St. Gaudens. That Commission made a careful study of Washington, particularly with a view to establishing a suitable park system and to the beautification of the city. So far as parks were concerned, the new Highway Plan had done nothing; it was strictly a plan for highways. No provision was made in it for the extension of the system of local parks shown in the original L'Enfant plan.

A RAILROAD PRESIDENT'S VISION

The first step in the execution of the 1901 Commission's plans for Washington, strangely enough, was not

taken by the Government, but by a great railroad corporation. Mr. Burnham got Mr. Cassatt, the President of the Pennsylvania Railroad, to stand on the terrace of the Capitol and look west; and persuaded him there and then—as Mr. Cassatt was a man of real vision—that the railroad should remove its tracks and station from the Mall and make other arrangements.

The railroad did make other arrangements; it re-located its tracks and built the beautiful new station that present-day visitors to Washington are familiar with. The traveller now comes in through a great portal, designed by Mr. Burnham himself, and views the Capitol as the first sight before him. Since that time the neighboring area between the station and the Capitol, where during the war temporary hotels were built to house government employees, has been purchased and the plans approved by Congress contemplate its development as part of the park plan.

At the foot of the Capitol some progress has been made in building the monuments which were designed as the main decorative feature of a plaza at its base. From this plaza two avenues, Pennsylvania and Maryland Avenues, diverge diagonally in different directions. The Botanic Garden, the shrubbery and trees of which hide the Grant Monument and interfere with the Meade Memorial, is to be removed to the other side of Maryland Avenue.

A PREDICTION THAT DIDN'T COME TRUE

The great Lincoln Memorial at the other end of the Mall has been completed. It quite belies Speaker Cannon's prediction. Mr. Cannon, for a long while Speaker of the House of Representatives, was a great

admirer of Mr. Lincoln, and was very strongly opposed to the location that was chosen for the Lincoln Memorial. At that time the site of it was a swamp reclaimed from the river by dredged material and was not very attractive. Mr. Cannon even said that if the Lincoln Memorial were put on that swamp, it would "in no time shake itself to pieces in loneliness and ague." This prediction has not yet come true.

From the Lincoln Memorial there is now in process of construction a great granite arch bridge to the Arlington Cemetery, an appropriate memorial to the thousands who have sacrificed themselves for their country but to whom individual memorials can not be built. Its axis is prolonged by a great avenue to a monumental entrance in the cemetery, whence roads will lead to the Grave of the Unknown Soldier and to the Arlington Mansion.

The charming Potomac Park of nearly a thousand acres was reclaimed from the River—to the great advantage of Washington; for it did away with the flats where the annual crop of mosquitoes was raised that gave Washington at one time a rather bad name for malaria. Today in that area there are five 9-hole golf courses with a use of about 250,000 persons' games a year. There are tennis courts which totalled in one month, summer before last, an attendance of over 10,000 persons; and, I think, 14 baseball fields which are in constant use, during good weather, as well as a pool which affords the most beautiful place for ice skating that I know of in the world. The cherry trees planted around the Tidal Basin are one of the interesting features of our Washington parks to thousands of visitors who come to Washington every Spring largely

to see the lovely cherry blossoms. So that it is a very fine investment for Washington that those flats were filled up and turned into park use.

THE McMILLAN PLAN

The McMillan or 1901 Commission planned a development of the Mall with lines of monumental buildings on each side of it, with service streets for these buildings and two park drives in the center between which an open *tapis vert* will afford an open vista from the Capitol to the Washington Monument. A new treatment of the Washington Monument grounds with sunken gardens was proposed, which would carry the axis south from the White House down to the river. A suggestion, first made by Colonel Bingham, of using the "Triangle" for new executive department buildings was renewed in the McMillan plan.

Quite a number of steps have been taken towards carrying out these recommendations. The new Senate and House office buildings on each side of the Capitol and the National Museum have been built and the new Department of Agriculture Building, started long ago, is now being completed, the center part being in course of construction. The new public buildings programme, the monuments for the plaza at the foot of Capitol Hill, and other projects already mentioned are so many steps in carrying out the 1901 plan.

Our Commission has attempted to bring up to date all the various projects that have been under way during the last few years in carrying out the general recommendations of the McMillan Plan. But we are going much further in many respects than could be foreseen at that time.

Not only is the Mall development being carried out as proposed in the 1901 plan, but a new office building for the House of Representatives, decided upon only within the last few weeks, is to be built; also the Department of Agriculture Building is to be completed with a large office building in the rear of it; a new civic center for the District activities is covered by a bill now before Congress. The construction of the Lincoln Memorial is now an accomplished fact. The Arlington Bridge, first recommended by the 1901 Commission at that place, is proceeding rapidly; as is also a new parkway connecting the Potomac Park system with the Rock Creek Park system.

HOW REPLATTING PAYS

One of the interesting features about the plan for the new public buildings that are to be built on the "Triangle," is that by replanning—by forgetting private property lines—it has been possible, we are told by the architects, to gain something like 15% of useful floor space for these public buildings, in spite of the fact that there is a magnificent center court and also ample courts for light in all the buildings. There has also been provided a great circular space somewhat like the Place Vendome in Paris—but considerably larger—and space is given for the development of various ornamental features. This case again demonstrates the benefits of planning.

Our Commission has been particularly interested in securing legislation to allow some sort of architectural control of private building operations in the immediate vicinity of the important public building development in the "Triangle" and other major building and park

projects. We feel that such control is quite justified because of the enhancement of values that will result on the north side of Pennsylvania Avenue, for instance, as a result of these new government buildings on the south side.

A GREAT PARK SYSTEM STARTED

As already stated, the L'Enfant Plan provided many little city parks. In the nineties a part of Rock Creek Valley was acquired, giving Washington a very remarkable and attractive sylvan parkway of 1600 acres extending through the main residential section of the city from pretty well down town to the very edge of the District. Later, as a result of the McMillan plan, the joining of the Rock Creek system with the Potomac Park system by an additional parkway down Rock Creek Valley was adopted.

This project affords another interesting object lesson in the economy of city planning, and in the preservation of valleys with steep side slopes for parks and open storm drainage. The land will have cost nearly \$1,900,000; whereas the storm water sewer alone, which would have been required, had the creek valley been filled in for regular city development, would have cost over \$6,000,000. Here is a clear saving to the taxpayers of over \$4,000,000, since the parkway roads will necessarily cost less than the city streets, as originally planned, would have cost—and this makes no allowance for the great traffic value of a broad drive from the heart of the chief residential section to the chief cross streets of the business and shopping section, which will pass under viaducts carrying all the principal intermediate cross streets.

Until recently, there has been no systematic attempt

made to carry out the 1901 plan. A few of the major projects were adopted; but during the period from 1901 until the formation of the National Capital Park and Planning Commission, first created to buy park land, there was an increase of only 24% in the area of park land in the District, with an increase of 70% in population and an increase of nearly 240% in property values, showing that the piecemeal method of acquiring park projects was proving little over a third as fast as the growth of population and a tenth as fast as the rise in land values.

PLANNING THE REGION AROUND WASHINGTON

Our Commission is the first body that has had any right or authority to consider Regional Planning for the District. This effort has met with good support in both Virginia and Maryland—legislation having been passed by both of these states setting up Planning Commissions to cooperate with us. Beside developing plans for regional highways and urging progress in regional zoning, the Commission has given much study to a Regional Park system. The Regional Park system is now before Congress in the form of a bill introduced by Representative Louis C. Cramton of Michigan (H. R. 15524), which it is hoped will be passed at the next session of Congress.

To arrive at plans for a suitable Regional Park system, all the places of special interest, of one kind or another, which should go into such a park system or be preserved in connection therewith were located and plotted on a series of maps—places of natural interest, such as bird refuges, points where plants of special interest are found, and where geological formations of inter-

est are to be observed. All of these different interests are found quite thickly in the Potomac Valley just above Washington.

The upper Potomac Valley from Great Falls down towards Washington is a wonderful area that is not yet urbanized or even suburbanized; we feel that it holds unique park possibilities. It contains not only the Great Falls themselves, which consist of a series of cataracts through which this river—quite large at times—rushes; but in addition to this it also contains other interesting natural features with rapids and tributaries having lesser falls of remarkable picturesqueness. In interesting contrast to the rush of the river and its rugged banks, the old Chesapeake and Ohio Canal, with its ageing locks and other masonry, offers a delightful stretch of peace and seclusion.

THE HAUNTS OF THE INDIANS

There are many places of Indian interest around Washington, the preservation of which we thought might be worth considering in connection with a Regional Park system. It is not generally known that Washington was quite an industrial center for the Indians, with soapstone quarries where they manufactured great quantities of household utensils, and flint quarries from which spearheads, hatchets and other sharp tools were turned out to supply a large number of the neighboring South Atlantic coast tribes.

We have also plotted maps in which there are places of special historic and architectural interest, like Mt. Vernon—to which a boulevard is now being built from the City of Washington, to constitute one of the great parkways of the Regional Park system.

On the opposite side of the river from Mt. Vernon is Fort Washington—designed by Major L'Enfant himself and partly built under his direction. From its old bastion there is a remarkable view of the city—one of the finest views obtainable anywhere. Moreover, it constitutes a natural terminus for a driveway on the east bank—corresponding to the one to Mt. Vernon on the west bank—making, either with a ferry or eventually with a bridge, a complete circuit of a little less than 30 miles.

There is also in course of development an additional river park, similar to the Potomac Park system, along the Anacostia River flats. This will afford the possibility, ultimately, of a park boulevard to Baltimore.

Other Regional parks to the north are desirable and feasible at not too great a cost; the continuation into Maryland of Rock Creek Park is important to preserve the flow of the stream, and a circumferential park drive, roughly paralleling the proposed Fort Drive within the District of Columbia, is needed for traffic purposes as well as to preserve for future generations, at least, a considerable part of the interesting topography and forests.

The Commission's work has, of course, included many other studies, essential to the preparation of a Master Plan for future development, the revision and extension of the L'Enfant Plan to provide for the city of his dreams, but one exceeding in size and civilization any dreams he could have had, as the country of which it is the Capital has already exceeded any possible stretch of his or President Washington's imagination. Even when the first Master Plan is drawn with the wisdom and good judgment possessed by these two founders of the Federal City, it can not provide without change for

more than half a century, and so Congress was wise in providing not only for the preparation of a revised plan, but also for its being continuously kept up to date, with all the modifications that experience and new conditions may require.

Will these plans be realized? They can be. It is the particularly inspiring quality of Washington that it still offers the possibility of realizing on the banks of the Potomac the ideal city such as city planners' dreams are made of. But this can be done only if the Nation at large insists upon it. We who are at work upon it must look exclusively to Congress for our legislation and our appropriations, even when the latter come from the taxes of the municipality, and Congress reflects the wishes and opinions of the whole country. Only too often the authority of Congress is needed and frequently obtained to overcome the opposition offered locally by the shortsightedness or selfishness of individuals, but its interest in the National Capital must be indorsed by the "folks at home," by the citizens who select its members.

The way lies open, but only nation-wide insistence on the part of the great mass of intelligent people will ensure our having a capital city so well and so economically developed, that the city planning profession can point to it with pride as the outstanding example of what can be accomplished by sound planning.

GOVERNMENTAL ORGANIZATION TO MAKE REGIONAL PLANS EFFECTIVE

MORRIS KNOWLES

Former Chairman, City Planning Commission, Pittsburgh

This subject, "Governmental Organization To Make Regional Plans Effective," may be considered under 5 headings:

First: Its Relation to Housing

Second: The History of Regional Planning

Third: The Real Problem—How To Make
Plans Effective

Fourth: The Methods Heretofore Tried

Fifth: The Solution Suggested at Pittsburgh

With regard to the first of these, it may almost be accepted that planning has a very definite relation to housing. Good housing depends upon good environment—the placement of the dwelling, its setting, accessibility and surroundings, and also the facilities for amenities outside the home.

Cost is an important factor—the cost not only of houses, but of land, streets, parks and public utilities, such as water, sewers, gas and electric service. In most housing developments the things other than the dwelling cost anywhere from 25% to 35% of the whole cost of the project. If we take into account some of the facilities outside municipal limits,—such as the main avenues of approach, the water supply brought from a

distance, or a disposal area for the proper treatment of sewage—then the percentage of cost for things other than the dwelling, is likely to be very much larger.

These land and utility costs—as well as the features of environment so necessary to good housing—depend on proper planning of urban areas, on ability to foresee the needs of the Region and to execute wisely. Efficiency and economy in carrying out these plans assume the existence of proper governmental control. We arrive at the conclusion, therefore, that stability and continuity depend to a great extent on the effectiveness of this governmental organization.

Regional planning, after all, is not really a new thing. As early as 1803 in Philadelphia they organized a Poor District and a Port District for the handling of such problems throughout the Region. As time went on, the increasing demand for improved water supplies, for sewage disposal and other services, and the rapid growth both of cities and suburbs showed the need for a regional view in the planning of utilities. In recent years this need has been intensified by the development of transportation; with the result that the population has extended beyond the city limits and has brought about the building of satellite towns. All these factors naturally led to the planning and building of utility systems to serve the whole Region, but there still was a lack of that coordination so vital to effective planning.

REGIONAL PLANNING APPEARS ON THE HORIZON

Not until some 10 or 15 years ago was there any real conception of Regional Planning as we know it today. Thomas Adams, a pioneer in 1916, in an address at Cleveland said:

The first thing you have to do is not to plan Cleveland, but to plan Ohio and fit the plan of Cleveland in with the plan of Ohio.

Adams' views were elaborated and made the basis of discussion at the National Conference on City Planning held at Niagara Falls and Buffalo in 1919. It is significant that Mr. Adams now is in charge of the largest regional planning project in the world.

Today, the Region—whether or not set off by definite political boundaries—is a distinct type of community and should be recognized as such in planning its future development. The Standard City Planning Act of the Advisory Committee on Zoning and City Planning of the U. S. Department of Commerce provides for the creation of Regional Planning Commissions. In the preparation of this Act the Committee recognized the state of the public mind with regard to regional organization, and the need of flexibility in its provisions.

TWO METHODS OF ORGANIZATION

The Act describes two ways in which Regional Planning Commissions may be organized. One of these is by petition to the Governor of a state. Another is the cooperative method. By this, a Region may be established and arrangements made for the appointment of a Regional Plan Commission and the making of a Plan through the cooperation of the County Commissioners and the Planning Commissions of one or more municipalities.

Even the Standard Act is in process of development, so far as coherent organization for making Regional Plans effective is concerned. This is no disparagement. As stated by the Committee in its Report,

In the case of the Region or metropolitan district, the logical and intelligent order of events is: First, The regional planning commission; Second, The Regional plan; And third, the creation of regional and metropolitan boards for the actual execution of regional or metropolitan public works and development.

The Standard Act deals only with the first two steps. It was thought that fixing the legal status of the plan was as far as the first enabling statute should go. It may well be said that perhaps a movement prior to any of these is the grouping of unofficial citizens' Committees, for the purpose of creating public sentiment that will later result in more definitely organized efforts.

President Hoover in a Foreword to the Standard Act supported this view, saying—

The portion on regional planning presents the primary need for bodies to study and define regional problems comprehensively as the first step toward solving them. * * * I thoroughly agree with the Committee that regional problems should be thoroughly analyzed and publicly discussed before supplementary or new Regional forms of government are set up to cope with them.

Here also is a recognition of the fact that for such plans to be effective, there must be some governmental agency later to be formed. After some 10 or 12 years of discussion of the subject of Regional Planning, we may now be ready to consider by what means we can make such suggestions effective.

THE GOVERNMENTAL AGENCY

At the present time effective action is limited by governmental factors. Until a Region becomes a com-

plete political unit, it is not wise to give a Regional Plan any effect in a municipality unless it is adopted by the local City Planning Commission. This is in accord with sound home rule principles, but may be a source of conflict. Utility companies object—and often rightly—to too many authorities. The legal status of the Plan is fixed by the Act, but the Committee recognized that difficult problems of execution remain unsolved. The answer does not seem to be in executing the regional plan through county government—a unit which is seldom well adapted to such functions, either from the standpoint of planning or execution. Notwithstanding its faults, the method in the Standard Act seems to be the reasonable and proper one under present governmental organization.

Carrying through this method to its logical conclusion, it becomes apparent that the next step to make the regional plan really effective, is some form of political consolidation of communities in the Region—a type of governmental organization toward which municipal development in America has been pointing for many years, but which has not yet been fully achieved in any instance.

VARIOUS FORMS OF CONSOLIDATION

The Pennsylvania law of 1836 was the first authority for local annexation—one of the methods of consolidation that have been tried. There are two methods of annexation, neither of which fills the bill. Voluntary annexation is difficult to accomplish. People in smaller communities are more homogeneous and do not shift about as much as those in cities; they have pride in the local community and it is only natural that

they want to handle their local affairs. Involuntary annexation is possible but not wise; it destroys that desirable quality of people wishing to do things for themselves.

The extension of municipal jurisdiction is not the answer to the problem. The people of the suburbs have no voice in the management of the facilities furnished; and such an arrangement is inconceivable in the case of the larger communities which adjoin the city.

Contracts between municipalities are applicable to only a few cases. Difficulties often arise in reference to contracts, due to changing municipal administration and conflict between city and suburbs. This is true of the water situation in Cleveland. In Pennsylvania, few attempts have been made to solve joint problems in this way.

The consolidation of city and county is feasible only where city and county boundaries are practically coterminous. The county is not a suitable unit for administrative purposes, having been designed originally for almost purely judicial functions.

“What about private enterprise—public utilities?” Good, if well regulated; but that does not apply to many utilities owned by the public, such as pavements, sewerage systems, and sometimes water systems. There still will be lack of proper coordination.

METROPOLITAN DISTRICTS

Another common type—very popular in America and inherited from Great Britain—is the Metropolitan District, generally organized for a single purpose, such as police, parks, water supply, sewerage, etc. Some common types of such districts are conservancy dis-

tricts, drainage districts, flood control districts, highway districts, metropolitan park districts, poor districts, reclamation districts, sanitary districts, sewerage districts and water districts. This does not include all. Some 47 varieties and 89 different districts have been listed by Professor F. H. Guild of the University of Kansas. His list includes 8 varieties of school districts under 34 names.

We find also some unusual and bizarre types, such as agricultural development districts, boat-course districts, community centers, forest-fire districts, junior-college districts, library districts, mine-drainage districts, mosquito-abatement districts, no-fence or stock-law districts, public-health districts, railroad-aid and benefit districts, slough districts and stumpage districts. In one state, California, there are 28 varieties of districts.

This is one of the evils that multiplies taxation. And districts often overlap each other; Cook county in Illinois is one of the worst examples of this. The idea of a separate organization for each type of work to be done is the outgrowth of studies for the construction of large public works—notably in the eastern part of Massachusetts and Boston—where they have constructed many notable and successful public works and have functioned efficiently.

But doubt arises as to such districts meeting the test of an administrative unit for complete coordinated government. There has been a change of view in recent years regarding the suitability of the Metropolitan District as an organization for regional government.

Discussing this question in 1919, we said:

Organization for carrying out the work of a regional plan is not solely an engineering problem. Existing political organizations must,

of course, be the basis of it; and intricate legal and organization problems must be solved to build up the group of related organizations—for each problem may require a separate organization—required to secure the results desired.

Such special districts are extremely paternalistic, and local people have little to say about the money paid out in taxes. Finally, there is complete lack of coordination; such districts are framed generally for one purpose only. But the question will not down. Many Regions are not satisfied with any type thus far evolved and are striving for a better solution.

The problem has become that of how to direct governmental activity so as to achieve the desired results, without at the same time sacrificing the individual pride and activity of local groups.

As Prof. W. J. Brown, of the University of Adelaide, South Australia, states in his book on "The Underlying Principles of Modern Legislation,"

If then we take the various factors already mentioned and regard them in combination, the pressure of social and economic problems, the democratization of our political machinery and the growth in the sense of collective responsibility, we must conclude that the supreme problem of the future will be, not how to thwart the movement towards state control, but how to direct it in such a way as to achieve legitimate ends without sacrificing the individuality of the citizens.

There is a human problem in regional government, and a proper solution will recognize the need of centralized authority in matters of common concern, with preservation of local freedom of action in purely local affairs.

A dip into past records shows that many of these topics were considered almost a hundred years ago. In 1854 a committee of Representatives and Senators of the Eastern part of Pennsylvania, considering the consolidation of Philadelphia with some of its suburbs, had the following to say:

It is not to be supposed that people in separate localities are not actuated by preferences and zeal for separate interests and by hostile feelings, and are often even obstructive to measures of common welfare. With no permanent legislative power or control, no uniformly operative laws can be adopted. . . . These diverse and unseen lines and complication of powers penalize and arrest every effort to advance the common welfare and avert general evils.

This might well be written today of our present conditions.

With an appreciation of these practical difficulties and the efforts that have heretofore been made in attempting to make a comprehensive plan effective in a disjointed group of entirely independent communities, and with the belief that the type of organization needed to make it effective will be based on the principle of centralized authority and local recognition, the proposed regional government of Pittsburgh and Allegheny County is presented as an experiment worth watching.

THE PRESENT PITTSBURGH PROJECT

In 1905, the large city of Allegheny was annexed to the city of Pittsburgh—not voluntarily. Although they were supposed to have a vote, the Allegheny vote was swamped in the greater vote of Pittsburgh. In 1911 the Allen Force Bills proposed the forcible annexation of Boroughs. This resulted in the formation of the League of Boroughs and Townships of Allegheny County. Largely through their influence, annexation bills were defeated in 1913, 1915 and 1917. In 1919 the League opposed a Metropolitan bill, largely because it created a super-government with an increase in the debt limit.

In 1920 the Pittsburgh Flood Commission urged Metropolitan government provisions before the Com-

mission on Constitutional Amendment and Revision and aroused interest in the need of such a plan for the Pittsburgh District. This resulted in a willingness on the part of people of different views to sit down around a table and confer, with the result that an unofficial Commission was appointed by the Pittsburgh Chamber of Commerce. While no definite results came from this, in 1923 an official Commission was appointed by the Governor under authority of a legislative resolution.

That Commission made a preliminary Report in 1924, looking toward the creation of what may be called a "Federal City." A constitutional amendment proposed by this Commission in its Report to the legislature was passed at the special session of 1926 and passed again in the session of 1927, and came for vote to the people of Pennsylvania at the election in November, 1928. That amendment passed by a rather small majority—by only 39,000 votes throughout the state.

A "FEDERAL CITY" PROPOSED

This amendment contemplates the formation of a "Federal City"—as truly federal as the organization of the United States Government—with certain inherent rights preserved, as is the case with the various states. It comprises a county and city unit in one.

The constitutional amendment gives authority to deal with problems affecting any two or more municipalities, or affecting the whole district. Such problems may include water supply, sewerage systems, transit lines, public utilities, main thoroughfares, through highways, tunnels, subways, bridges and other public works of regional character; also the development of a unified park system, coordination of various police

forces and fire departments and the administration of general health policies and welfare departments.

Provision is made for the election of a Board of Commissioners as a legislative body, and the appointment of executive and administrative officials, and for reorganization of minor courts within the greater city. Antiquated court procedure may be corrected. Debts of constituent units for the construction of jointly used public works, which will be transferred to the greater city, will be assumed by the central government. In addition, the charter may provide for the assessment of property for taxation, the levying and collection of taxes and the payment of the cost of any public improvement—either in whole or in part—by special assessment upon abutting and non-abutting property materially benefited.

The new government is also definitely given authority for zoning. The commissioners of the central government are given authority to create special improvement districts for the financing and construction of certain works, such as drainage, sewage disposal, and garbage collection and disposal. Construction and operation of such works will remain in the hands of the consolidated city.

POWERS RETAINED BY LOCAL UNITS

Certain powers are definitely set forth to be reserved to the separate municipalities as follows:

The power to levy and collect taxes for any lawful purpose.

The power to acquire, own, construct, maintain and operate public property, works, improvements, utilities or services which have to do only with local needs.

The power to maintain a local police and fire department—in some cases this may be supplemental to the department of the consolidated city.

The power to establish a limitation of indebtedness for the consolidated city and its municipal divisions.

The constitutional and legal capacity of municipal corporations, except as limited in the charter.

All other powers not specifically granted by the charter to the consolidated city.

This is the picture of the federated city. There are other provisions in the new charter which provide for planning of a very comprehensive character, and with the same intent and purpose of not destroying local initiative, but serving as the guiding power with regard to major purposes.

The Charter is in process of drafting and will be submitted to the legislature shortly, to be voted upon in June by the people of Allegheny County, with nominations for office at the primary election in September. Thus, the commissioners to administer the new scheme may be elected in November and the new "Federated City" become effective January 1st, next.

This effort we think is well worth watching. We hope it will succeed.

THE CITY OF DREADFUL HEIGHT

LAWSON PURDY

Chairman, Tenement House Committee of N. Y.

My text is taken from the *N. Y. Sun* of January 21
in the column known as the Sun Dial.

Little Jack Horner
Rode past a corner,
Under the traffic ban;
He drove round all night
For a chance to turn right,
And then he abandoned the plan.

To those who live in the city of New York that will
not be new. Some who do not read the New York
newspapers may not know that we have reached that
state prophesied by the late Nelson P. Lewis, this dozen
years ago, when there are so many theaters in the
theatre zone that it has become impossible to get to the
theatre.

The Dial points out

Mary had a little jam,
It seemed to grow and grow,
And everywhere that Mary drove,
The jam was sure to go.
It followed her out shopping,
And it trailed her to the play
"I do not see," said Mary,
"How the traffic gets that way."
So she bought a pogo stick,
One January day,
And after that she managed,
To get up and down Broadway.

Then there is still one that appeals to me

Where are you going, my pretty maid?

I am going to the theatre, sir, she said,

May I go with you there, my dear?

Hop in she said if you've got a year.

That is what has happened to the theater zone. Mr. Whalen, our Police Commissioner, has recently devised a plan by which the cross streets are one-way streets, alternately east-bound and west-bound, and there are no turns to the right or left for a space of a mile. The north and south streets are two-way streets, but there is no turn right or left on them either for a space of a mile. Persons who have gone to the theater in the last few days say that this change has worked a miracle. But what will the next Police Commissioner do when, in spite of this miracle, we are in the same condition once more?

Not far from this theatre zone, just to the south on Seventh Avenue, between Thirty-Sixth and Thirty-Eighth Streets, in New York, we now have buildings of 20 to 25 stories in height housing garment workers by the thousands. One of the reasons that led to the appointment of the Zoning Commission 13 years ago, and the Commission that preceded it—the Height of Buildings Commission—was the condition on Fifth Avenue south of Twenty-third Street where the garment workers so jammed Fifth Avenue as to drive everyone else away.

10 MILLIONS IN VALUES BLOTTED OUT

Within a few years there was a fearful loss in values. I remember in particular the block, Fifth Avenue to Sixth Avenue, Twenty-third to Twenty-second Streets, declining from 17 million dollars to 7 million dollars in value in the space of 3 or 4 years.

The zoning ordinance adopted in 1916 forbade industry from coming into new buildings, or into existing buildings not then occupied for industry, in the district north of Twenty-third Street and east of Broadway, up to Fifty-ninth Street.

The "Save New York Committee"—organized chiefly by the merchants who did business north of Thirty-fourth Street—tried to get the industrial managers who had already encroached north of Thirty-fourth Street to remove out of that district. They did it in a very efficient manner and without any statute law. Their experience corroborated what I have long believed, that when people are sufficiently civilized to cooperate efficiently, they can—without law—accomplish results utterly impossible to be accomplished by statute. The "Save New York Committee" performed wonders.

It was very natural that the men who were asked to move should ask "Where shall we go?" And the "Save New York Committee" stimulated the erection of buildings west of Seventh Avenue to which these garment makers could move. They ought not to have gone there; they ought to have gone miles from that congested center. I think no one who thought about it had any other view. But they could not be induced to move very far. They wanted to have the office and the factory together; and they wanted an office near the great railroad centers and near the shopping district of the city of New York. These great buildings were erected and the crowds that used to be south of Thirty-fourth Street and along Fifth Avenue north of Twenty-third Street, were then to be found on Seventh Avenue.

STREETS BECOME IMPASSABLE

A little while ago it got so bad that the men who managed the business—the proprietors themselves—appealed to the Police Commissioner to do something about the crowds between twelve and one o'clock, when these workers went down upon the streets for their noonday airing. The proprietors said that their customers could not get access to the buildings at all and that something had to be done about it.

They had made their bed, but they did not like it, and were not willing to lie in it the way they had made it. So, the Police Commissioner has made the sidewalks one-way sidewalks from Thirty-sixth to Thirty-eighth Street on Seventh Ave. Pedestrians may walk only north on the east side and southward on the west side of that street between certain hours.

But the workers did not like having to walk only up one side of the street and down the other. So, the Police Commissioner has made Thirty-sixth Street a "play street," with vehicles excluded for this hour. Recently, I went there to see what it looked like. I walked up, as the law required, on the easterly side of Seventh Avenue in a great crowd and crossed over at Thirty-eighth Street and walked down on the west side, and there was another great crowd on that side. At Thirty-sixth Street the street was jammed as far as I could see from building line to building line—a sixty foot street.

That is what we have come to in the great city of New York. For the double reason that we have loaded the land with buildings more than the street space renders practicable and reasonable; and we have put

industry, in spite of our zoning ordinance, where it does not belong. We could stand the industry, if we did not have about 6 or 8 times as much building there as we have any right to have.

THE FOLLY OF 56-STORY BUILDINGS

We are now arranging in another part of the city of New York for a condition just as bad—with a different set of people. In the last few years the office center of the city—which used to be at the southerly end of the island of Manhattan—has been duplicated around Forty-second Street near the Grand Central Station.

Only the other day there was opened at 42nd Street and Lexington Avenue, a new building, the Chanin Building, 56 stories high, said to be for 10,000 tenants. Lexington Avenue, is a 75-foot street. Forty-second Street is a 100-foot street. The sidewalks on Lexington Avenue are about 15 feet wide. If those 10,000 tenants walk down on that one-way sidewalk, it would take over half a mile of sidewalk to accommodate the tenants of that one building alone. And yet another building, its mate, even taller, is now being erected on the opposite corner.

In that neighborhood—a very small area—last year alone, we erected buildings to be ready for occupancy in 1929 for 30,000 tenants, just a few buildings. There are others that I do not know about. Buildings now in contemplation or started, it is said, will be opened in 1930 for another 28,000 tenants. Let us, for the sake of speaking in round figures, call it 60,000 people on a 20-foot sidewalk. There are 4 of them to the foot; divide this 60,000 and we have got 15,000 feet, or 3 miles of 20-foot sidewalk to accommodate those people alone.

And they have all got to go down into holes in the ground in that neighborhood.

I am not averse to skyscrapers. In suitable places I like them. The problem is, what shall the bulk of a building be? And how far shall its walls be away from its neighbor? That is the crux of the whole thing. We haven't anything on Manhattan Island, bad as we are, that compares with what is to be found right here in Philadelphia. Within a stone's throw of us there is a new building 22 stories high that has no yard. Oh, maybe there is a yard of 10 feet; and it is next to an alley that is not 30 feet wide. On the other side of it there is a passageway just wide enough for me to walk through—that is all. If other buildings should rise as close to that building as they can—as in fact they now have a legal right to do in Philadelphia—the revenue from that building would be practically nil. That is one of the phases of this skyscraper situation which people do not think about—until they get hurt.

HIGH BUILDINGS STEAL THE OTHER MAN'S LIGHT

I served a good many years as President of the Tax Department of the City of New York and in the course of my experience I saw building after building go up; be reasonably successful as long as it stole its light and air; and fail when some one else took the light and air and none was left. Buildings, like these, many of them, not only are unsatisfactory for the tenant, but they will be mighty unsatisfactory to the owners some day—just as many of them have been in the past in the city of New York.

THEY WERE WISER IN ANCIENT DAYS

This need for light is a very anciently recognized need and a very anciently recognized right. The city of

Pompeii in 80 B. C. paid damages when the city built a wall that was as high as the eaves of the houses that were built near the wall—and they should have paid damages, too. Along about 800 years afterward—doubtless there were many other cases in the interval, but I do not happen to recall them—in the city of Byzantium, one Petronius, brother-in-law of the Emperor, built a palace without thought of the poor widow who owned a house next door. She appealed to the Emperor who ordered Petronius to tear down his palace and be scourged through the public streets. That was efficiency.

Then we come down to modern English practice. The English courts wrestle over each particular case for the protection of the right to light, which a man enjoys who has had windows in the wall of his building for some length of time. Circumstances differ, of course, in almost every case. But they all turn upon the angle of light—which generally is 45 degrees, sometimes a little less for particular reasons, sometimes a little more for other particular reasons.

A SOUND RULE FOR HEIGHT CONTROL

In general, the bounding wall must not be nearer to the building than the height of the building, and it is a good rule that has very much to support it in practice.

This rule which finds adherence in nearly all the European cities and has a lot to support it in the scientific studies of men who have studied light, is a very practical and sensible rule.

It is a sound rule also from the point of view of avoiding traffic congestion. In some studies made a few years ago in a section of Broadway in New York

it was found that, while—in some buildings the number of square feet per worker might be as low as 50, and in others a little over 100, it averaged not far from 75—to be liberal I will say 100; a hundred is so much easier to multiply and divide with. Now, suppose the street is 50 feet wide; and suppose a building 5 stories high and 100 feet deep is erected on either side of it; then suppose for each front foot of the building, there are 5 workers in the building.

We summarize the computation thus:

For each 100 feet on each floor, one worker. If there are 5 floors there would be 5 workers for each front foot of building. Each person requires 5 square feet of sidewalk or street on which to walk, and a street 50 feet wide supplies 50 square feet for each running foot, and this would accommodate 10 workers. Thus, a street as great in width as the height of the buildings fronting upon it affords a sufficient space for all the persons in the building to walk in one direction at one time. This is corroborating evidence that the 45 degree angle of light is a reasonable one as providing adequate street space.

The city of Paris has a limit of some 20 meters in height to the cornice line—a little more on a parabolic curve, and higher for the wide streets and less for the narrow streets. Probably Paris averages a little over 5 stories. Nearly every lot is built to as full a height as the law allows.

The Borough of Manhattan, when we did the work on our zoning ordinance in 1913 was covered to an average height of 4.1 stories. A few months ago that average height had risen to 4.9 stories. Under our present zoning rule in the city of New York, we can

average over 10. Where are we going to be if we do average over 10 stories, if we are where we are now with five?

Each day we are devising some new scheme for routing our traffic so that we can get about at all. Doubtless there are better schemes and better will be applied, and traffic will be speeded more and more; and in time we will stop "parking" altogether, which merchants won't like. But we shall probably do it; and then, probably, we shall banish all pleasure vehicles from the streets. I don't know what will come after that. Maybe all the trucks will have to move at night; and then we will have 2-story streets and 3-story streets. They are coming I fear, in New York, but I hope we won't have them in the other cities of the country.

SAVE THE REST OF THE CITY

Our motto in zoning should be "*Sauve que peut*"—save what we can, before it is too late. Don't postpone getting a zoning ordinance until we can get an ideal one for the congested centers; let us take what we can get now. As for the congested centers let them go to their own ruin, if we must, because such centers are never very big in a city of 500,000 or a million.

But let us save the rest of the city while there is still time. Let us keep down the height throughout the rest of the city. Above all, let us make a rule that no wall shall be higher than the distance between it and its neighbor—between the backs of abutting buildings the distance should be the height of the wall; and the height of the front wall should never be more than the width of the street. I do not object to towers properly placed, but the bulk should not be increased by the

erection of the tower; let the rest come down. If a man wants to build a one-story building, let him build it and put a tower in the middle of it, provided its aggregate bulk is not more than 50 cubic feet for each square foot of ground.

Don't let's spoil all the cities of the country. Let us do all we can to save the environs of our large cities from the fate that has come upon us in these congested centers. And we have seen only the beginning of it. We are travelling straight to a very disagreeable, difficult, unpleasant situation and one that will bring great destruction of property values.

Let us profit by the mistakes of the big cities and do our best for the future of the smaller cities of the country.

DO WE WANT THREE-LEVEL STREETS?

HARVEY WILEY CORBETT

Architect

I think I am here under a slight misapprehension. I note that I am to talk on the subject "Do We Want Three-Level Streets?" Mr. Purdy has very successfully answered that question beyond doubt. Apparently, I will have to talk on his subject—the City of Dreadful Height. (Laughter.) I can assure you that it makes little difference what an architect talks about, he is asked so many foolish questions by his clients that he soon rises to answer any subject—and, of course, in a convincing manner.

I am to talk on the subject of "Do We Want Three-Level Streets?" Now I am going to ask all of you present who do want three-level streets, if you will kindly raise your hands. I thought the ladies would support me, anyway. (Laughter.) Well, I was told the other day by a jealous rival architect "Corbett, you could sell palm leaf fans to the Esquimos at the north pole, if you had to." And I am apparently expected to sell the three-level street. Judging from the response of this audience, I think the palm leaf fan business would be better. (Laughter.)

Mr. Purdy has told you that we are going to have three-level streets. I am willing to take his word for it. He is a very responsible man with both feet on the ground—or on the elevated sidewalk, as the case may

be. We *are* going to have them and the subject of this talk should be "What shall we do with the three-level streets?" Not, "Do we want them?" We might as well discuss "Do we want radio announcers?" Or "Do we want cigarette ads or vaccination?" (Laughter.) I can think of a lot of things that we have that we do not necessarily want, but we are certainly going to get three-level streets.

Now Mr. Purdy and I are in accord on most subjects, but we disagree on some things; one is this idea of the economic advantage of the right kind of concentration in cities.

I am a thorough believer in putting just as many people per acre of land as can possibly be put on the land in certain sections of our city where business is being carried on—consistent with health, ease of movement and comfort.

CONCENTRATION OFTEN DESIRABLE

There are many advantages in that type of concentration. From my office in New York—because we have the habit in America of centering businesses of the same kind in the same region—I can call any architect, engineer, material supply man or building contractor in the city on the telephone; and by walking—even through the crowded streets and through the traffic—in fifteen minutes be in his office or have him in mine for the necessary personal conference which has to go on for successful business.

That is simply due to the fact that through the Forty-second Street zone there is this tremendous concentration of business space. To do the same thing in London—where I occasionally have work to carry on

in our London office—I find that if I can keep three conferences a day I am in luck, because the architects and the builders are scattered over that great city; and it means that I have to leave the office, or they have to leave their office, get into some form of conveyance, and clutter up the street in order to make the necessary personal contact.

That is a point we should not overlook in the development of cities. We must not destroy any of the advantages that have been developed in our city progress; and in approaching this subject we should keep that fact in mind. This condition obtains in most of our cities. It is increasing, and we are going to find it very difficult in these outlying suburbs to which Mr. Purdy so lightly refers, to control growth.

THE SKY-SCRAPER TENDENCY

There are economic forces back of growth which are more forceful than theory. The tendency in all our towns is towards skyscrapers. People are proud of them. I have just built one in Allentown 22 stories high—the only building over 4 stories in the city—and the people stand around and admire it. They think they are like New York. (Laughter.) That is an attitude of mind that has to be dealt with.

Incidentally, that particular building houses all the activities of the Pennsylvania Power and Light Co. They were scattered over the city in a dozen different buildings, and they had to provide a corps of motors for their employes to move about between the different departments—adding to the street congestion. Now they are all in one building and instead of motors they use elevators, and the whole efficiency of the business

is improved. That is an example of concentrated population in a business zone over a given area.

In view of these facts, we must concede that we are going to have three-level streets. I do not know why they limited me to three levels! I feel hurt that they should have put a number on it. (Laughter.) But we will have *at least* three-level streets. I am not ambitious to appear in the world as an advocate of three-level streets. I can think of many things I would rather be an advocate of; but since I am accused of that attitude of mind, I would like to explain just how I feel about it.

I am convinced, as Mr. Purdy is, that we are going to have them. Why? Because we are just choked to death in our existing cities. We do have them, we have already arrived at that point, and we must do something to increase the capacity of our streets to fit the buildings we have built.

Whether it is a mistake, whether we have done the wrong thing or not, we are just like the man who has eaten too much or drunk too much and lived too high, and finally gets blood pressure; his circulation does not move well; he rushes to the doctor; and, if the doctor says so, he is ready to perform a capital operation.

We shall probably have to perform several capital operations on our cities in order to keep the circulation of the city going; but it is essential that we keep it going. To do that, the first thing is to increase the capacity of our streets. Widening them does not really increase their capacity, because the only part of the street which you use, except when you are passing through it, is the edge of the street. Supposing streets were 150 feet wide and the street was full of traffic and you happened to be in the middle in your car, what

good would it do you? You have got to get to the edge of the street before it is of any use. So the solution is not in widening the street.

THREE-LEVEL STREETS ESSENTIAL

The only solution I can see is to do with the street what we have already done with our buildings—and that is, double-deck them and triple-deck them. That will be done. It is to be done, in a measure, in the proposal which has recently been presented for Mr. Rockefeller's development around the new opera house in New York, where he has taken three and four squares on Fifth Avenue opposite the Cathedral. They definitely propose to elevate the sidewalks one level throughout that region, so that pedestrians—at least through that small section of the city—can move about with some comfort and peace and freedom and rapidity, if they want to.

So we are confronted with this problem; and it is our job as city planners to meet the problem frankly and to try to meet it as intelligently as possible—not to shy away from it.

The country is lovely. I like it just as much as you do. I like to move out of this intolerable city of dreadful height—occasionally; once every two weeks, or something of that kind—not otherwise. (Laughter.) I am always surprised that gatherings of this kind, where people are all interested in open air and taking the people out among the flowers and the daffodils, should meet in a concentrated, highly developed hotel in the center of the most congested part of the city. Why not meet in the open? Why not let this conference be an illustration of what you want the rest of the community to do? But none of you do that. (Laughter.)

People won't stay away from the city; they will concentrate as much as they physically can. Our problem is to deal with that phase of it. The problem of properly handling the concentrated centers of our city is an infinitely more complicated, difficult one to deal with than the problem of moving out into the open country and planning new districts. It requires more courage and vision. And I think that the men who are willing to devote time, thought, vision and imagination to that problem deserve as much credit as those who simply, quietly, easily move out into the unbuilt land and proceed to develop it.

You have to move a certain portion of all your population into the country. There is no doubt about that. But there is nothing more ridiculous than our present habit of moving at enormous expense the entire population of the city twice daily over a ride that varies from half an hour to an hour and a half.

DWELLINGS ON TOP OF BUSINESS BUILDINGS

I look forward to a time when habitations will be made part of those same concentrated business centers that we now have. I think they can be made attractive, interesting and livable. But of course this cannot be done by individuals building on single little pieces of property. It will have to be done through cooperative effort—an idea towards which all of us are tending.

There are only two kinds of people in the world—those who have children, and those who haven't. Those who have children should live in the country. (Laughter.) I will agree with that. But you must remember that those who have children have them for a shorter and a shorter time every year. In the old

days, we used to have our children with us till they were ready to vote; now we have them till they are about seven years old; then they are sent away to school and then the parents are left with nothing to do. The children are cared for—they can see them occasionally on visits—so, of course, the country is lovely; they like the sunset, but it is a little dry and they move to the city.

I am proposing to house all these people right on top of business blocks in a lovely “frosting,” so to speak, with a sidewalk—this is the fourth sidewalk, now, not the third—at that upper elevated level above the business level, and then the residences terracing back the depth of one room. The buildings are to be oriented north and south in our particular latitude so that every room will have sunshine and air—at least during one part of the day—and out of every room there will be a terrace where you can walk. And when father comes home at night, tired after a hard day’s business in the block below, he just simply takes the elevator and if he is two minutes late for supper, he will have to make an explanation.

This upper level will be only for pedestrians. The first level just back of it will be for small shops—almost exclusively delicatessen shops. There will be no baby carriages on this level—they are all in the country; and above that, as I say, we have this “frosting” of residents. Then, in the interior of this great domed affair will be the community rooms, the radio broadcasting station, the moving pictures, the dance halls, the common dining-room. We are coming to it.

See how many times most of us, Mr. Purdy and myself and these gentlemen along here, take their meals in

the common dining-room. We have to. It is just occasions like this. I get home so seldom that the other evening I dressed for dinner at home. And my small boy asked mother who that strange gentleman was. And as soon as coffee was served, I automatically arose and said "Ladies and gentlemen." (Laughter.)

But, getting back to the three-level streets, my only thought in that connection is this. We are going to have them. How shall we have them? It seems to me very simple.

THREE LEVELS FOR RAIL, WHEEL AND FOOT

I propose that we divide them into three levels; one, rail; one, wheel; and one, foot. For a long time we have conceded that railroads and wagons and motors do not go together very well on the same level at the same time. New York State is spending 90 million dollars to eliminate grade crossings in connection with her railroads. That is quite a budget.

And yet in our cities we put pedestrians and wheels and rails all together on the same level. Now rails are the heaviest in weight; they carry the heaviest loads. Why not put them underneath? They are already going there. The trolley car is certainly doomed; it is disappearing from our streets; it will soon be off our streets; it will have to go, subways are taking its place. Put them under ground.

On the surface of the ground, which is there for the purpose, which does not have to be built up or dug out, place the wheel traffic—which is the growing traffic certainly growing beyond any imaginative bounds. And then, above that, one story up, put the pedestrians. They are the lightest; the easiest to raise; they lift

themselves by stairways. And you have divided the traffic on an intelligent basis.

When I have proposed this, people have sometimes had the idea that I thought this ought to be extended over the whole United States into the country. But I do not suggest that. I only propose that such a system should be installed in the already existing concentrated business centers of our cities, and that it should extend and grow only as necessity demands.

The pedestrian arriving from the outside—if there are any pedestrians left at that time—would move with perfect freedom through the city, through the shopping district. We would have two shops where one grew before—one below for the automobilist, who, you know, buys different things, higher class things than the pedestrian; one above for the pedestrian. Or, the automobilist could drive in underneath and have room there to park his car, go through the shops on that floor, rise one story and move about through the whole shopping center undisturbed.

ARCADED SIDEWALKS TOO

Those sidewalks should not be projecting sidewalks; they should be arcaded within the building line so as not to project and shut out light. Then we would have a city in which the sidewalks were arcaded within the building line, where the people moved about protected from the sun of summer and the snows of winter, crossing by light bridges over the street corners, and moving with the same freedom you do in Venice where there are no automobiles.

We would have a city which would be a modern Venice, the only difference being that the canals, in-

stead of being filled with water, would be filled with a great flood of moving traffic, the sun glittering on the tops of the moving cars as they pass.

I could become quite poetical on this if I kept on. I think we can visualize a city that would be a marvelous improvement on anything we know today, that would have the advantage of concentrated population living happily and peacefully and in an orderly way.

So I would set up a set of rules for three-level streets. Now, that does not mean a set of rules saying that we are going to have three-level streets. It is only a set of rules saying what we shall do with the three-level streets when we get them. And that rule is simply: Rails underground; wheels on the ground, and pedestrians one story up.

If you will put those rules on the wall of your city planning department, when it becomes necessary for you to change levels—and we are already doing it in New York—just make sure that the change follows that rule. Why? Because, as this thing expands, let us try to bring out of it a little intelligent order and arrangement, instead of the helter skelter sort of thing that we have been doing.

If we do not set up some such principle as that in regard to this thing which confronts us, then we will be going up one flight at this corner and over the street at the next corner; we will go into a hole and go under the street, and in the meantime automobiles will be ducking down and rising up and it will be confusion worse confounded.

My only appeal on this whole proposition is that we bring to bear on it as a problem all the factors—not only decentralization but concentration with the ad-

vantages of both—and that we deal with them intelligently, consistently, setting up rules and principles that are sound, bringing all the knowledge to bear on it that we can, with full knowledge of the problem in a scientific and intelligent way, and deal with it as a community, as a whole and not simply as individuals, as we have done in the past.

SOCIAL VALUES IN BETTER HOUSING

WILLIAM H. FINESHRIBER

Philadelphia

I was very much interested in a little note that was sent me when I was invited to this little party. It said below "This is to be an informal affair." I soon discovered that the gentleman or lady who had indited that postscript down there was telling the truth, because I notice how very informal these speeches have been tonight. Each man speaks on the other man's topic. And now I am supposed to speak about a subject upon which I know a great deal less than the gentlemen who have spoken—or are supposed to have spoken—on the topics assigned to them. So you see it is just a little family affair. We are here informally, and it does not make much difference what we say or how we say it, which puts me at my ease; because I was tremendously befuddled by the addresses of both my predecessors.

The gentleman to my right, who seems to be an expert on taxes and traffic conditions, and the gentleman on my left who seems to be an expert on high buildings and other things, have rambled about delightfully and have left nothing for me to say; because, for a moment, I thought I was going to speak on Housing Conditions and Their Social Values, but they have prepared the way for me, and now you shall hear what you will usually hear from almost any preacher on any Sunday morning at any church, a sermon upon something other than the text assigned to him. (Laughter.)

I think that my friend, Mr. Corbett, over here on my left, has in him the makings of a fine historical romancer. As I listened to his address it reminded me inevitably of an architect's sketch, in that it is composed partly of truth and largely of fiction. (Laughter.) I enjoyed this very beautiful picture that he so graphically described of this modern city with its innumerable levels and with its great roof gardens on which are housed the population—excepting the babies,—who are always relegated to the country. This latter is the only saving thing in the entire scheme; because for once human beings are considered and given the advantages of sunshine and air and all the beneficent aspects of nature.

But you and I and all the rest are merely cogs in the machine. We are here because we are here; and because we are here we have to fit into the picture somehow; and because we have to do business and speed up traffic and speed up business; and because we have to be efficient; therefore we have to live in these one, two, three, four or five story levels and be subjected to all these iniquities of which these gentlemen speak so learnedly.

I was tremendously impressed with the amazing ingenuity of these men, and of men like unto them, as I am impressed with the amazing ingenuity of our modern civilization. But what is the substance of it all? A great city like New York, a great city like Philadelphia, finds itself in the year 1929 so congested—having taken no thought in the days of its birth and in its growth—that we today are compelled to resort to extraordinary methods in order that we may walk about, in order that we may be driven about, in order that we may live. And when all is said and done, and when all these rosy pic-

tures that Mr. Corbett and Mr. Purdy have painted become realities, and we have solved—for the period of ten years—the traffic problem and the housing problem in those congested districts, may I ask, what are we going to do then? And what relation has what we do then to the fundamental problem of the development of human beings and taking care of their social and other relationships?

For, I proceed on the theory, ladies and gentlemen, that it is a dangerous thing for people to live together in such close proximity by the millions and millions. I do not know that any good can come out of it except efficiency; and the finest picture of the good to come out of it was the picture drawn by Mr. Corbett when he said that he could sit in his office and in a few moments' time get in touch with any of the men he wants to deal with. That seems to be the American ideal. But according to my view, cities are to be designed for living places and for working places, in order that men may live and not merely exist.

I have the curious theory that men come first, and their lives come first, and their safety comes first, and their health comes first, and decency comes first, and righteousness comes first; and that all other things are but subsidiary. I am inclined to believe that all of you agree with me, and that we are simply muddled up now in a situation created years and years ago, and which we are trying to remedy. We are treating symptoms, when what we ought to do is to treat causes.

Now, the moment I say that, then of course all of you will say "Yes indeed, we agree with that, that is perfectly true, but as practical men and women we have to deal with the situation as we find it." Of course we do,

and I am really and genuinely full of amazement at the ingenuities of these men, the profound and accurate knowledge they have of existing conditions, and the devices that they have to remedy a given situation. But remember that New York is not the only city in the world; Philadelphia is not the only city in the world, though there are people who so believe.

New cities will to be born—new civilizations are in the making right now. I see evidences here and there of people coming up from the depths of this thing to sanity, and envisaging the world, not in terms of space and area and population, and height of buildings, and efficiency and speed, and all the rest of those things. But I am inclined to believe that there are people who are viewing the world now from the point of view of human relationships and decency and all the rest of it.

I was amused by the pictures that have been given tonight, and by the background behind these pictures, the picture of only one group of people in the world, only one class, the class, for example, that Mr. Corbett alluded to, who send their children at the age of seven to a boarding-school and never meet their children until they come home occasionally on vacations and all that sort of thing. But the bulk of the people live right here within a stone's throw of where we are; the bulk of the population live ten and twelve in two rooms; the bulk of the population live in dirt and crime; the bulk of the population have no air; the bulk of the population live in narrow little streets that are so dirty that they are a disgrace to this community, and papers fly about the street and cinders fly into their eyes, dust and dirt go into their nostrils and lungs; all of which contributes to the high mortality rate. Clean streets,

clean and airy houses, that is our problem; that is the housing situation; that is the fundamental thing.

Are we intelligent enough and civilized enough, despite all our magnificent inventions and our grandiose dreams—are we intelligent enough to tackle the problem as it is right at its base? Are we giving our people an opportunity to breathe, to live, to get a little sunshine? The answer is, we are not. Why? Because we have muddled into this situation just as we muddled into our big cities, and if we do not stop this thing, only God knows to what end we will come.

I do not ignore the fact that there are evidences of growth. We have now, thank the Lord, in this city a Regional Planning Committee, which is beginning to put this chaos into some kind of order. We have here individual enterprises that are trying to build the new houses under auspices that will give an opportunity to people to breathe and have some degree of privacy. I see the evidences of growth; but still we have not attacked the problem at its roots.

The great mass of the people are utterly indifferent to the situation. Here is a handful of people, two hundred in this room; the people here are interested in this housing problem, which is basic to our civilization, but the great mass do not know anything about it and do not care anything about it. That is symptomatic of our whole attitude towards our social life today, not only in cities but in the country as a whole.

One of the great slogans in the last campaign was "Don't let government interfere with business." You know what the implications of that thing are. Why, that is our whole psychology towards all these problems. We want to be individuals, want to live our own

life; we do not care to be bound together in any corporate group; we do not want to assume the burdens of the community; we put responsibilities away, and we pride ourselves on the fact that that is what makes business. It may. I don't know. I am no business man. I have my grave doubts about it. I think in the long run business is going to topple just because of that blind attitude towards life. I can see only one solution of the problem. It is that we become civilized. We are not yet civilized.

I do not know of a really civilized spot on this whole earth-ball of ours, not one; and by civilization I mean that intelligent men and women get together and intelligently solve their problems, having the group in mind as well as their own selfish interests. I can hear some of you say that that would mean a reconstruction of the personality, a reconstruction of our human nature. Yes, that is exactly what it means, and you are not going to solve your housing problem, you are not going to solve your traffic problem, you are not going to solve your political or any social problem whatever until at last we begin to reconstruct our personality. We have got to begin with our children and make them see that every individual must develop a sense of responsibility, that he cannot live unto himself alone. We have got to teach them the old-fashioned doctrine that we preachers used to teach years and years ago, that is to be found in the Bible and in all Scriptures. It is a long, long road; I am aware of it. It is Utopian, I am convinced, and it will be condemned because it is a long, long road and because it is Utopian, and yet, I see no other way out of it. For, the housing problem is but in miniature the problem of our whole civilized world.

Now the social values of this housing problem,—why speak about it? Every single one of you knows perfectly well that you cannot get any kind of good breed or good stock unless you house it properly. In Iowa, where I lived for a while, they housed pigs magnificently; they housed cattle beautifully. I have been in barns that are marvelous, where every cow gets plenty of good, fresh air—something that architects sometimes neglect in the construction of their houses—where they get plenty of sunshine and do not have to go to the doctor to get violet rays. But people in the housing districts do not get much chance at violet rays—do not get much chance at sunshine.

What are we going to do about it? That is the distressing problem which every great city has. I am not altogether convinced that it is going to be done through mechanics and ingenuity and elaborate planning. These things are all necessary, and in the last analysis we have to rely upon these experts and these men, but you will not touch the heart of the people by that. And unless the people's imaginations are stimulated—unless we can take these comfortable, smug people out of their homes and take them to the teeming millions of our people who never have the opportunity for air and sunshine, we will never do anything with them. Then all our plans will gang-agley; all our fine schemes will tumble down, as they have tumbled down over and over again.

We have to make the people understand that the housing problem is a problem that goes deep down into the roots of our being; that none of us is safe unless the people are properly housed; that criminality will result from it; that many of our criminals are born and bred just in those places where two families live in three

rooms, where there is dirt, where there is not only dirt of the body but dirt of the mind; where there is contagion that is caused by the crowd; where there is poison that is distilled, as I honestly believe, when too many people get together in one place. Gradually they will come to think of decentralization. I think the pendulum will swing the other way, Mr. Corbett, and that ultimately, in a century from now, we will not have to tackle that great problem of congestion in the large cities, but people will become a little more intelligent every decade, until finally they learn to live like human beings.

One of the things I dread most of all is the terrific speed of our modern civilized life. I see the thousands upon thousands of business men with their interminable Conferences, never having any real home life, wasting their time by pushing forward. Pushing forward, to what end? It is that old story of Li Hung Chang which has stayed in my memory. You remember it, I am sure you do. He was being rushed through Chicago, shown the stockyards and the Lake Front, and the Museum and Loop, that beautiful Loop (Laughter) and the interminable rows of houses out on the west side and the north side, and the tenements and apartments and flats, and all that sort of thing, and then the conductor in charge took him rapidly into a taxi and hurried him off into a train, and looked at his watch constantly, and finally said to Li Hung Chang, with a great smile of triumph, "My heavens, I did not think I could make it, but we have saved ten minutes on the trip." And Li Hung Chang looked at him very blandly and said, "What are you going to do with that ten minutes?" That is exactly it. What are we going to do with that speed? What are we going to do with that height?

What are we going to do with those great magnitudes, with this complex civilization, when we are neglecting the essential things which are the development of human lives and art and literature and life? Well, a different kind of housing will, I think, help the situation.

I do not mean to say that it is going to produce poets immediately or philosophers. I do not think it is going to breed immediately a finer breed of men, but I simply base my inferences and my hopes on this bottom fact that we can make a finer breed of animals by better housing and better conditions. We make cows give more milk, we make better oxen and sheep and hens, and what not, when we give them better housing conditions. It seems to me an inescapable inference that if we give our humanity better housing conditions, we will probably have a better grade of human beings. I do not know of a better goal for civilization than to have better and finer human beings—not more of them necessarily—but finer and better human beings.

To that I hope the discussion of these housing problems will lead ultimately, and I hope that the men and women who are here will not go away from this Conference merely overloaded with technical problems, but will keep clear before their minds—as I compel myself to keep clear before my own mind—this question, What are we going to do with it? What is the meaning of all this speed, all this wealth, all these ramifications of our far-flung civilization? Is not the goal that I mentioned a moment ago, a better and finer humanity—the thing we must keep inevitably in mind—and is not that the thing that in all discussion of the housing problem we must keep in the forefront, a finer and better humanity? God grant that this Convention will bring that to a successful end.

DISCUSSIONS

THE STEEL-FRAME HOUSE ARRIVES

ROBERT TAPPAN

Architect

GENERAL DISCUSSION

So much interest has been aroused by Mr. Tappan's ideas that we give in full the general discussion that was had of his Paper and the accompanying lantern slides and moving picture films, which, unfortunately, we cannot reproduce here—EDITOR.

MR. TAPPAN: This is a sketch of a little four-room house built for the Government during the war. There is one big living room 12 by 20 on the first floor. Next to it is a kitchen, 12 by 12, and behind that is a bathroom and stair hall, and on the second floor is a cross ventilated bedroom, 12 by 12 and another bedroom, 9 by 12 with the usual closets and linen closet. The chimney, if it is made of steel, acts as a ventilating chimney. It starts at the first floor ceiling, directly over the stove, and the smoke goes up through a flue in the center of the square box and the air around it keeps the chimney cool, and at the same time ventilates the kitchen.

Here you have 15 different houses; they are all made around the same steel chassis. In this drawing I have tried to illustrate my contention that you can standardize 75% of the house, but by varying the remaining 25% you can get all the variety in form—to say nothing of whatever color arrangement you desire.

Starting with this little house in the upper left hand corner, that is the simplest shape. It has 6 rooms; it is a typical American house with a living room 12 by 24 feet and a staircase going up at one end of it; a clothes closet under the stairway, a cellar and behind it a dining-room, 13 by 13 feet, and a kitchen 11 by 12 feet. On the second floor one big bedroom the same size as the living room, and behind it a smaller bedroom with a bathroom in between, so that all the rooms have cross-ventilation.

All the rest of these houses are simply variations of the first house. In the upper left hand corner here are the assembled drawings of that first house. You will see here the living room with the steel staircase going up in the back and the coat closet underneath it.

Then in the kitchen I would like to point out different articles of equipment we supply. Here is a breakfast nook, entirely made of steel, with a little table on casters. We find that a breakfast nook table, if placed on casters, has many other uses than a built-in table could ever have; it can be moved to the sink for washing the dishes, moved to the stove when cooking, and there are shelves underneath it, and you can move it to the living room and serve tea on it.

On the second floor there is one large bedroom which can be made into two by an additional partition, and behind it are two smaller rooms with cross ventilation and a little steel chimney is right here. That steel chimney starts directly over the stove and the Arcola hot water heater, and all you see in the kitchen is simply a register. All the foul air in the kitchen goes up this register and is dissipated at the top of the chimney and the smoke goes up the chimney just the same.

A MEMBER: What is the price of that house?

MR. TAPPAN: I wish I knew. In Detroit last winter a friend of mine, who is also a friend of Mr. Ford, asked him one day what the new car was going to cost. He said "Father has not told us yet." It is entirely a question of mass production. We are assembling our costs in Akron and it is interesting to see the tremendous saving we can make merely by buying 100 items instead of buying 10 at a time. Take one of those little steel closets in the kitchen—a little broom closet—if we order 10 of them from the sheet steel manufacturer, they cost about \$80 a piece, but if we order 100 of them, they only cost \$25 a piece. I do not know what they will cost if we order 1000 of them.

A MEMBER: What is the ground floor plan dimension?

MR. TAPPAN: Twenty-five feet square, that is the outside dimensions. It is actually 24 feet, 9 inches, by 25 feet, 2 inches.

A MEMBER: Do you furnish the entire house complete?

MR. TAPPAN: That is our object, but there again we will follow the example of the automobile industry. Take Henry Ford—when he first started to make automobiles, he did not manufacture all the parts himself, he had different parts made for him and his was simply an assembling plant. That is our programme in Akron; we won't make anything ourselves. You see there is nothing monopolistic in house-building work; we can find scores of manufacturers who are glad to give us estimates from our shop drawings. Our only job is to make the design, prepare our shop details and invite competitive bids. Ultimately, we will make a great

many of the things ourselves, when we find that we can do it cheaper than the manufacturers can quote us prices; but for the present we propose to have all the different parts of this house made for us and we will assemble them and ship them to our customers.

A MEMBER: Do you design steel fireplaces too?

MR. TAPPAN: A fireplace is treated as an accessory. If you want one, you have to put it in yourself; though we are perfectly willing to show you all kinds of designs of fireplaces, outside or inside chimneys, brick chimneys, etc. We are concerned merely with the shell of the house and with its standardized equipment.

This shop drawing is a little distorted on the screen, but it may serve to illustrate how simple this method of construction is. All of the beams used for the house—there are only two kinds of channels and I-beams—are all the same height and have the same holes for connections, and then on the walls, the gable walls here repeat three times. There are the two outside gables and then an inside gable; those three are interchangeable, and the man who erects this house has simply to assemble these wall-bearing units flat on the ground by using a monkey wrench and pitch them into place and lay the floor beams on top of them, and assemble the second floor panels, and lay the roof beams on top of that. Everything is interchangeable. We do not even need to put diagrams on. With the steel, it is not like a ready-cut house, where it is a Chinese puzzle to find the parts you want. Here, there are only 11 or 12 different parts in the whole thing.

Here is a diagram of a portion of the steel frame. The first thing to do is to construct a trench wall foundation, simply dig a trench and dump in a moderately

good quality of concrete. In that concrete we set anchor bolts. There is one indicated right there, another there and another here. Nine (9) are required. If we are building those houses in the west, in a tornado country, we might advise the purchaser to put in more than nine; but I think nine will hold the house on the ground pretty well. The next step is to lay on the floor beams. They are all exactly alike; lay the floor beams on first.

Next, assemble this wall flat on the ground and pitch it up in place on top of the ends of these floor beams and bolt it to them. Then do the same thing with the interior partitions and the same with the other gables. You are ready then to put on the second floor beams. They are exactly like the first. As soon as they are in place, you can pass these pieces up, one at a time, and assemble the second floor units on the second floor, or assemble it on the ground and lift it into place. The heaviest member in the house is the floor beam. That floor beam is about 25 feet long and weighs 250 pounds. Three men can handle it easily.

A MEMBER: What size floor beam do you use?

MR. TAPPAN: It is entirely a question of the span. On this plan we use a 5-inch standard beam weighing 10 pounds. These are details illustrating the connections at the different parts of the building. We are getting these things in the form of a graphic specification to show the farmer and his boys or any one in the wilderness how this house goes together. This connection is absolutely standard on any house we build—whether a large one or a small house or any house at all—always this same connection. Here is the first floor supporting panel. These little twin angles hold the posts together,

and here is the second floor beam held to this panel by using a bolt and a washer. That form of connection is used all over the house, you simply use a bolt and button, as I call them, the house is buttoned together. Here is a view showing how the second floor panel is secured to the same beam. As you screw up the nut the washer bends a little, and it is literally impossible for the nut to unscrew.

A MEMBER: How are the lower members protected from rust?

MR. TAPPAN: The moisture does not come in contact with the steel at all; it is protected, first by a shop coat of paint, then a steel coat of paint and is surrounded by concrete.

A MEMBER: How about the inside of your steel chimney?

MR. TAPPAN: There is no exposure there except the foul air; we use copper bearing steel lath and stucco and plaster it as the work proceeds. This is the second floor connection at the wall; here is a floor panel; here is the same button, and here is the non-bearing wall on the side, which is put up in long pieces, spanning from the ground to the eaves. That is bolted individually to the wall channel. Here is a typical roof connection. You see the same method of connection is used everywhere. There is the bolt and the button, and this beam is interchangeable with the floor beams. This is the way we enclose the house; imagine that you are standing inside the house looking toward the outside walls. This panel comes from our plant completely made of metal lath and light steel angles. This is the little steel angle right here that runs all the way around the panel. A metal sash is also electrically welded in place.

When the time comes to put that panel up, a workman simply has to pick it up and lay it against the frame of the house. As he holds it against the frame of the house, another skilled mechanic takes a hammer and hits it as indicated by those three shaded spots there; hits that angle with a hammer, bending it over so that it clinches against the flange of the post. That is a very simple and quick way of enclosing the house. We use that same method for putting on the floor panels.

Here is a typical floor panel; it is 12 feet long, exactly the length of the room. It is a little less than 4 feet wide, very light; it is simply picked up and dropped on the floor; then you hit the little angle right here that runs underneath with a hammer, and it bends right around the steel frame. Here is the roof panel, which is handled by the same method. These little angles here are also spot welded on to the panel to support the weight of the wet concrete, which is rather heavy. That metal lath is sufficient in itself to provide a strong floor or roof slab, but we have to provide for the weight of the wet concrete; rather than go to the expense and trouble of temporarily shoring up these panels from below—the usual custom—we put in these supplementary reinforcing angles, which support the weight of the wet concrete, added to the weight of the slab.

A MEMBER: What keeps the gunnite from going through?

MR. TAPPAN: It does go through, but not too far; it is all in the trick of knowing how to do it. During the war gunnite boats were built at Philadelphia and they went outside and shot from the outside and shot from the inside, and I have been told that those boats are still in use by the navy. Here is the breakfast nook.

This little dining table is on casters and there are shelves below that to take miscellaneous equipment. The table top and the seat tops are rubber tile, so that if the table pitches over it won't smash anything. Here is a typical window unit; where heat is placed we put a brass radiator behind that stamped steel shield. The radiators are all connected with copper pipes. We find that we can string copper pipes around with fewer connections and install copper pipes much as you would install BX cable in electrical equipment. The wall is 5 inches thick.

A MEMBER: Can you get all your bends, valves and everything in there?

MR. TAPPAN: Oh, easily, easily.

A MEMBER: How thick is the wall back of the radiator?

MR. TAPPAN: The posts that support this house are 3-inch I-beams; the space we have for the radiator is about $2\frac{1}{2}$ inches. Here is a little drawing of the completed house; stucco walls or brick walls, if you wish. If you want brick walls, it is like putting on your overcoat. We build a house and you can put 4 inches of brick outside, if you want to pay for it. Here is the tile roof. These tiles are about 2 feet long with an 8-inch exposure. They are scored on the back and laid with cement. It is considerably cheaper than an ordinary commercial tile roof.

A MEMBER: How are they secured?

MR. TAPPAN: By cement, just as you lay walls on the bathroom.

A MEMBER: Do you rent the guns?

MR. TAPPAN: You can own your own gun; the gun is a wholesale proposition. If a man wanted to build one

house, it would not pay to either rent or buy a gun, but if a man was building 50 houses, it would certainly pay him to buy a gun.

A MEMBER: I mean if a man bought his own house.

MR. TAPPAN: This is not a retail proposition; I do not know whether the time will come when we can ever sell houses retail. Our market is for the man who builds for others; we hope and expect to sell to builders who, in turn, will sell to others.

A MEMBER: Have any of those houses been actually constructed? Have you ever put all this method of construction into practical application?

MR. TAPPAN: I am just about to show a moving picture, showing the construction of one of these houses.

A MEMBER: Why do you eliminate the cellar from your house?

MR. TAPPAN: It is a question for the customer to decide; if he wants to build a cellar we have no objection, only we cannot sell cellars very well.

A MEMBER: I mean is it adapted to a cellar?

MR. TAPPAN: Oh certainly, they can build a cellar if they want to.

A MEMBER: To what range of temperature do you think this house is adapted?

MR. TAPPAN: Our standard specification for the house would enable us to build the same house in Labrador or in Cuba, because the insulation we use in the walls and roof works both ways, it will keep the house warm in Labrador and cool in Cuba.

A MEMBER: Our experience in Canada is that the steel sash settles in cold weather.

MR. TAPPAN: I think there are many objections to

steel sash, but we propose to use them because it will seem curious to the trade if we advertise steel houses and put in wooden windows. I have wooden windows in my own house at home and I think there are many things to be said in favor of a wooden window. You could insert a storm window if you chose, in place of a screen.

A MEMBER: Have you any air space?

MR. TAPPAN: Oh yes, a three and a half inch air space.

A MEMBER: You have that outside and inside?

MR. TAPPAN: Yes, and then in between we have insulation. Insulation is applied against the inside of the outside stucco.

A MEMBER: You would not seriously recommend a 2-inch finishing wall to be used in the cellar?

MR. TAPPAN: Yes, I do; in fact I have just completed a house with that method at Easthampton, L. I.

A MEMBER: Have you had any experience with the frost lifting effect?

MR. TAPPAN: Not where it is of proper grade.

A MEMBER: We suffer a great deal from frost lifting in Canada.

MR. TAPPAN: I think you would have to provide ways and means to guard against that, but you would have the same condition if you built a wooden house.

A MEMBER: You cannot adopt a standard for that.

MR. TAPPAN: It will have to be varied to meet the local conditions. What I am trying to demonstrate here is that 75% of the house can be made in the factory instead of being built by skilled labor in the field.

A MEMBER: Are any of those houses in use?

MR. TAPPAN: Yes.

A MEMBER: What is the limit of the number you sell?

MR. TAPPAN: It is difficult for us to say. If we can carry 50 houses on hand, I do not see any reason why we could not sell one single house, as long as the purchaser does not require us to go around with it and set it up. We have an elaborate specification which can be printed in different languages, and with that specification we will cover every single step in putting up the house, down to the screwing up of the last connection in the plumbing.

A MEMBER: What is the cost per cubic foot of the house you built for yourself?

MR. TAPPAN: About the same as a wood and brick house, about 48 cents per cubic foot. This is a high-class house. It is difficult to talk cubic foot costs; because you are thinking of one form of construction or equipment, and I, perhaps, of another; but our experience shows that we can put up the shell of the house—that is the skeleton and the walls and the floors—of steel and concrete just as cheaply as a good carpenter can put up an ordinary wooden frame. But when you get into items of equipment, plumbing and heating, electrical equipment, flooring, etc., there is naturally room for a tremendous variation in cost.

A MEMBER: From the standpoint of the National Housing Association we are interested in workmen's houses; that would determine the cost of fixture we are going to use. Can you underbid the frame and brick construction per cubic foot?

MR. TAPPAN: Oh yes, easily, easily.

A MEMBER: What would be the life of such a house?

MR. TAPPAN: Why, it is hard to say, I imagine it would last 100 years.

A MEMBER: You say a 4-inch brick wall; would you put stucco back of that?

MR. TAPPAN: I use that as a veneer over the stucco. We build the house complete before we put on the brick. The brick would simply be an overcoat.

A MEMBER: You have not tried any substitute for stucco under the brick veneer?

MR. TAPPAN: We have tried all kinds of things. We are working now on bricks only half an inch thick laid like tiles.

A MEMBER: I wanted to ask you if you are using structural rolled shapes and not steel lumber?

MR. TAPPAN: I cannot see any advantage at all in steel lumber. It costs more per pound; it requires more parts; you have to space the parts closer together; they have to be cross-braced against a side sway; and a steel lumber house vibrates very unpleasantly. Now structural steel costs much less per pound. I do not have to use as many parts, therefore; do not have to have as many connections, and you can jump up and down on the floor of a little house like this made with structural steel and you would think you were jumping up and down in the street; it is absolutely rigid.

You remember the old saying that a ton of steel used for darning needles sells for more than a ton used for steel rails. The entire steel industry is trying to sell steel at a higher price per pound and I think that really is the basic reason why we see so many of these steel devices being put on the market. It is a curious thing that steel as a basic building material seems to sell today closer to the cost of production than any other basic building material.

A MEMBER: Could such a house be moved easily?

MR. TAPPAN: That brings up another point. Ever since the days of Noah the community has recognized the house as an integral part of the land. Actually we can build a steel house and take it down again. I am working now with some gentlemen who own some land on Long Island which they do not want to sell, and I am proposing that they erect some temporary tax-payers of steel; and then, when they want to sell the land, they can advertise the houses for sale and set them up somewhere else. When you put a wooden house together, you practically ruin it for salvage possibilities; but when you put a steel house together, by taking out your monkey wrench you can take the whole thing down again and move it somewhere else.

A MEMBER: In other words, you would have to put a guard there when you went off for a summer vacation.

MR. TAPPAN: There are thousands and thousands of acres of land on Long Island which can be put to work by setting up these houses, which can be taken down again at any time and erected elsewhere.

A MEMBER: But did you take into consideration that the house is a part of the ground? To give a mortgage in this case, would that be considered as just a fixture to the ground?

A MEMBER: How about the stucco?

MR. TAPPAN: You can cover the house with stucco panels, divided by little metal strips. These panels are only 4 feet wide and 8 feet high, and can be completely stuccoed in the factory and set in place with a strip of copper separating them, and then the whole thing can be taken down and shipped somewhere else.

A MEMBER: What is your interior plaster?

MR. TAPPAN: That is a plaster that the DuPont Company have been working on now for a couple of years, and ultimately they are going to have it ready for commercial use. It is put on through a gun, not by a trowel. You hold the hose and spray it on.

A MEMBER: With this exterior gunnite what do you use?

MR. TAPPAN: We use Highrib; our insulation is placed against the backing laths before we shoot the gun, so that the gun does not shoot through it.

THE CHAIRMAN: While not claiming to be a prophet, it seems to me that we have listened to something this morning which is the beginning of an epoch-making event. If these plans Mr. Tappan proposes are carried out, it seems to me it may revolutionize the whole building industry of the United States to our very great advantage. I might add just one little suggestion that may be helpful to him. Not long ago, there was an autoist driving through one of the roads of Delaware County, who saw a contractor making a rather large excavation by the side of the road. He asked him what he was doing. The reply was "I am digging a big hole, and when I get it finished, I am going to cut it up into small holes and sell it to the farmers for post holes." Why couldn't Mr. Tappan do that and furnish the cellars? There is one thing that should be remembered by every one here, to put the shell of the house on a par with the interior equipment. I hope we will all jot that down and remember it. It means so much.

A MEMBER: Can I ask Mr. Tappan a question? I want to congratulate him on the idea of mass production in house construction. I have been working on that

myself for many years and have had a great deal of experience with cement guns. I want to raise this question—mass production for residences naturally has to follow on economical lines, where the residence is going to be built. In other words, we could not build that house in Philadelphia on account of restrictions in our building code; you could not build it in New York or Chicago. To have mass production, you must build in big cities. How are you going to overcome the building ordinances?

MR. TAPPAN: The little steel house you just saw in the moving pictures completely complied with the New York City building code; in fact it is built in New York City.

A MEMBER: You have your fire limits, and inside the fire limit you cannot build masonry walls of less than a certain thickness. It cannot be done because I tried to do it.

MR. TAPPAN: I have taken that up with the Building Departments of Queens, Brooklyn and Manhattan and they have all agreed to let me do it. I am not however particularly keen about building these houses in cities. I do not think the people who own their own homes should live in a city.

A MEMBER: But you have to face a condition and not a theory.

MR. TAPPAN: I am simply a manufacturer of houses; I have an economic affair for sale, I do not care where it goes, I do not care who buys it. My interest in it, you might say, stops as soon as we fill the order and the goods leave the plant. It is only occasionally that we will follow this house into the building to see that it is

set up properly. Of course the obligation is on us to do that at the start; but after this thing once gets going, I hope to have some 5000 or 6000 associated builders all over the country who will start out local agents and see that the house after it arrives at the job is assembled as it should be.

THE STEEL-FRAME HOUSE ARRIVES

ROBERT L. DAVISON

Director of Research, Architectural Record, N. Y.

I agree with Mr. Tappan and Mr. McNary on the present situation in the building industry, as I think all of us do. We all agree that the solution will be to put the house-construction business on the same basis as the automobile industry. Just how that is to be done, I do not believe any one at the present time knows. I am not going to attempt to discuss Mr. Tappan's paper or method of construction in detail; the time is too limited for that. One would have to have also a good many drawings and charts for detailed analyses.

But what I want to do is to try and put before you a method of analyzing new construction methods. You can make your own analysis of these new methods as they come along. This is one page of about 40 that I have analyzing various construction methods. I have here an ordinary 8-inch brick wall, lath and plaster, with a total cost of 82.7 cents per square foot of wall.

Mr. Tappan says the cubic foot method does not mean anything; and it does not. You will get cubic foot costs all the way from 35 to 50 cents, depending on the method you use in figuring your building. I recently made an analysis of one apartment building and found that there was that much difference, that is, 15 cents a cubic foot difference, depending on which method you used for figuring the cost. Cubic foot costs

SCHEDULE OF COMPARISONS EXTERIOR WALLS

	Brick Sunny- side	20 lb. Aero- crete Blocks 8x8x16	100 lb. Aerocrete Section 4'x2'x8'		144 lb. Rock- wood Sections 6'x16' x18"	420 lb. Aero- crete Stuccoed factory 4'x4'x8'	260 lb. Solo- mite Stuccoed factory 3'x4'x8"	Van Guilder Double Wall	Gunite Outside Plaster Celotex Inside	Fish Steel Frame Gunite	Lakeol Pre Cast Outside and Inside
			Ribs	No Ribs							
Material.....	.27	.2120	.1576	.1576	.18	.1576	.0666	.12	..	..	.05
Labor.....	.335	.1070	.05	.05	.05	.05	.05	.216	..	..	.1165
Mortar, ribs, studs material and labor.....	.063	.0270	.10	..	.10	.10	..	..	.10	.20	.0765
Scaffolding.....	.015	.0150	..	..	..	..	..	.015	..	..	..
Royalty or rent.....	..	.013	.0066	.0066	..	.0066	..	.015	..	..	.05
Net wall.....	.683	.3740	.3142	.2142	.33	.3142	.2166	.366	..	..	..
Stucco material.....	..	.0450	.0450	.0450	.0450	.0250	.0250	.045	.045	.090	.293
Stucco labor.....	..	.1150	.1150	.1150	.115	.0250	.0250	.115	.115	.23	..
Reinforced mesh.....	..	..	..	..	..	..	..	..	.030	.04	.0550
Reinforced labor.....	..	..	..	..	..	..	..	..	.020	.04	..
Plaster material.....	.024	.0240	.0240	.0240	.024	.0240	.024	.0240	.024	..	..
Plaster labor.....	.052	.0520	.0520	.0520	.0520	.0520	.0520	.0520	.0520	..	..
Lath and plaster material.....	.021	..	..	..	..	..	..	..	.045	..	..
Lath and plaster labor.....	.047	..	..	..	..	..	..	..	.020	..	..
Finish brick.....	.040	..	..	..	..	..	..	..	..	..	.05 brick face
Furring.....	.060	(.08)	..	..	..	..	..	..	.08	..	..
Deduct if make block.....	..	..	..	..	..	..	..	..	..	..	..
TOTAL with stucco and plaster.....	.927	.5300	.5502	.4502	.5660	..	..	.602	.531	..	..
Deduct for 1/4" Stucco.....	..	.08	.08	.08	..	..	..	.08	..	..	..
TOTAL for 1/4" stucco.....	..	.4500	.4702	.3702	..	..	..	.522	..	..	..
Deduct if cement paint used.....	..	.07	.07	.07	..	..	..	.07	..	..	..
TOTAL for wall paper.....	..	.3800	.4002	.3002	.5660	.4402	.3426	.452	.5310	..	..
Deduct plaster if morene used.....	..	.076	.076	.076	.076	.076	.076	.076	.076	..	..
TOTAL morene.....	..	.304	.3242	.2242	.490	.3642	.2666	.376	.4550	.60	.3980

are all right as a rough method; but in dwelling house construction the cubic foot method does not mean much.

It means almost nothing in comparing new types of construction. You have to analyze each type of construction down to its various units. Here I have the exterior wall analyzed down on a square foot basis, 92.7 cents for the brick. I won't go into details on some of these construction methods.

Here is a block of aerated concrete, 8 by 8 by 16 inches. By adding aluminum powder to concrete you get what produces a cellular concrete, high in insulating value. Whether it is any good or not, I am not saying. There are arguments on both sides. Some people say it deteriorates; others say that it does not have the insulating value that is claimed for it. Using this, we have for the net wall a cost of 37 cents, as compared to 68 cents for the net wall cost of brick. Then, adding stucco and plaster for the same unit cost as used in the brick wall—of course in the brick you do not have the stucco—you get a cost of 43 cents. If only a single coat of stucco is used, there would be a reduction of 8 cents. If you did not use any coat, you would get a further reduction to 38 cents per square foot. If you eliminated plaster on the inside and just painted the wall, there would be a further reduction as indicated in the table.

The Van Guilder wall is a double concrete wall made with a small portable form about 4 feet long. The cost on the Van Guilder wall alone is 36 cents. If you want to cut cost, you can paint the exterior with a cement coat or give it one coat of stucco instead of three, which makes it cost 52 cents; or it can be left natural at a cost of 45 cents.

There have been buildings built with this Van Guilder method without stucco on the outside. A New York banker has built a fine estate in New Jersey where the Van Guilder wall was left natural. I think concrete should be used without stucco on the outside. You get more character to it and it is considerably cheaper. Los Angeles has used concrete without stucco to a considerable extent. Some very beautiful churches and clubs in Los Angeles use the concrete in this manner. In some Los Angeles clubs certain rooms have been finished in concrete left natural with a very beautiful effect. If they can do it in residences for bankers and in clubs, it would seem that it might be possible to use it in that same way for people who want to get a cheaper house. Of course there is the psychological factor that you can cheapen a thing when you have the money, while if you cheapen it when you don't have the money it is evident you are trying to save. Leaving aside the psychological factor, there is no reason why this sort of finish could not be used. The interior wall may be covered with Morene or some other kind of plastic wall finish instead of plaster.

I have here the heat conduction factors (page 281) through various walls, given in B. t. u.'s, or in cents; that is, if you lose 29 B. t. u. it is equivalent to 29 cents of heat loss through this brick wall.

Then of course you wish to consider the sound-conduction factor. For example, the sound resistance of this wall is superior to any other on the page. You wish a house that will not conduct sound from one wall to the other. Concrete block in a party wall in a row of houses will conduct much more sound than two separate concrete walls. I am getting figures on this now and I expect to have more.

	Dollars or B. T. U.'s	Per Cent Increase Wind
BRICK.....	.286	16.42
8" brick, $\frac{3}{4}$ x $1\frac{1}{2}$ furring, lath and plaster		
VAN GUILDER POURED WALL.....	.288	17.
8" stucco, 3" cinder concrete, 2" air space, 3" cinder concrete and $\frac{3}{4}$ " plaster		
VAN GUILDER POURED WALL AND SAWDUST.....	.155	
SOLOMITE.....	.137	7.3
$\frac{3}{4}$ " stucco, 3" Solomite, $\frac{1}{2}$ " plaster		
SOLOMITE—FOR ROOF.....	.069	
Aerocrete beams 2 layers Solomite, tar and gravel		
SUNNYSIDE ROOF.....	.30	
Lath and plaster, 2 x 6 ceiling joists, 3 x 8 rafters, sheathing and tar and gravel		
AEROCRETE BLOCKS 8" x 8" x 16".....	.187	10.15
$\frac{3}{4}$ " stucco, 8" 30-pound Aerocrete, $\frac{3}{4}$ " plaster		
AEROCRETE SECTIONS 4" x 2' x 8'.....	.299	18.05
$\frac{3}{4}$ " Gunitite, 4" Aerocrete, $\frac{3}{4}$ " plaster		
ROCKWOOD.....	.297	17.5
$\frac{3}{4}$ " stucco, 1" Gypsum, 4" air space, 1" Gypsum, $\frac{1}{2}$ " plaster		
INGERSOLL.....	.287	16.38
$\frac{3}{4}$ " stucco, 6" cinder concrete, $\frac{3}{4}$ " x $1\frac{1}{2}$ " furring strip, wood, lath and plaster		
STRUCTOLITE.....	.334	20.05
$\frac{3}{4}$ " stucco, 6" Structolite concrete (Gypsum and cinders) $\frac{1}{2}$ " plaster		
STONE TILE.....	.272	15.8
$\frac{3}{4}$ " stucco, $1\frac{3}{4}$ " web, $4\frac{1}{4}$ " air, $1\frac{3}{4}$ " web furring strip, lath and plaster		
CINDER BLOCK.....	.257	14.78
$\frac{3}{4}$ " stucco, 2" web, 4" air, 2" web, lath and plaster		
CONCRETE LUMBER.....	.263	15.58
$\frac{3}{4}$ " stucco, 1" concrete, 1" rib, 16" on center, 5" air space between ribs $\frac{3}{4}$ " x 1" furring strip on rib, $\frac{1}{2}$ " Celotex and $\frac{1}{2}$ " plaster		
LAKEOLITH.....	.443	28.4
Concrete $\frac{3}{4}$ ", connecting rib with Celotex at right angles to prevent conduction through rib, $\frac{1}{2}$ " inner wall of concrete		
LAKEOLITH—WITH SAWDUST INSULATION.....	.184	3.26
GUNITITE AND CELOTEX.....	.275	15.62
1" concrete, 2 x 3 cement ribs with $\frac{3}{4}$ " x 2" wood furring strip, 16" center, $\frac{1}{2}$ " Celotex and $\frac{1}{2}$ " plaster		
GUNITITE OVER CELOTEX AND CELOTEX WITH PLASTER....	.204	10.17
$\frac{3}{4}$ " stucco, $\frac{1}{2}$ " Celotex, 2 x 3 rib and $\frac{3}{4}$ " x 2" wood furring, $\frac{1}{2}$ " Celotex, $\frac{1}{2}$ " plaster		

In the steel frame—this does not happen to be Mr. Tappan's method—you have steel frame cost here of 20 cents and a total cost with the stucco of 60 cents. Mr. Tappan speaks of using a precast cement slab for the wall. I think that would be a very good thing. He may be able to cast slabs with a brick face and attach them to the steel, and they may find that they can take that slab and put a little wing on the back of it and eliminate steel completely. In fact, there is a company in New York doing that now; they have this thin slab and bolt the slabs together without any steel.

I have a comparison here with frame cost per square foot of wall. You have here a cost of 26 cents in contrast to a brick wall at 68 cents. You have here 42.9 cents without the paint to compare with those costs here, and with the paint about 47 cents. Of course, these costs will vary. That is clapboard and diagonal sheathing, labor for the two; labor cost and scaffolding cost; then here is the same for plaster, the same figures I have used here.

The main thing in an analysis of this character is to keep the same unit all the way through; you cannot compare the cost of a frame house with the cost of a concrete house if you are using a different stucco and different labor costs on the two; you do not get anywhere in a real comparison that way.

ABOLISHING THE DOMESTIC LOCK-STEP— THE SCIENTIFIC KITCHEN

GRACE GODFREY

Home Economics Department, Drexel Institute, Philadelphia

When one visits some of the old museum houses in the city of Philadelphia he realizes that the kitchen of the olden days was a very fine type of place for sociability in the family group—large enough to take care of the family and all the neighbors.

However, looking around those kitchens, one realizes one of the reasons why the women of that day spent from 8 to 10 hours in the kitchen, rather than the 3 hours which Miss Kneeland has suggested is an average today. The equipment there was arranged with no thought of the relationship that it bore to the type of work in which it was to function.

From that spacious type of kitchen we have come today to one of diminishing size. Some builders seem to think that mere smallness of equipment, smallness of space, will, of itself, mean minimizing work. In many cases the kitchen has shrunk to such a small compass that no one could possibly work within it. Recently, I went into a modern building expensively priced as to rental, with a kitchen so small that one could scarcely get inside the room; a sink into which one could not even put a 7-inch salad plate to wash it; an oven in which one could only use a 4-hole muffin tin—everything so small that there was no place to cook or serve

a family meal. People living in that house would, of necessity, be forced to eat most of their meals in a restaurant. We have the idea of economizing space so much in our minds that we fail to fully realize what that space is to be utilized for.

Miss Kneeland said that we have attempted to educate the woman to think about the home equipment in relation to her work. However, we have not gone too far with this. Women are not as a rule good buyers of kitchens. They will select the kitchen for a single bit of merchandise; it may be an electric refrigerator; it may be a special type of cabinet; it may be an incinerator. The builder has added this one feature in the kitchen because of its value in promoting the sale or rental of the property.

Much needs to be done in thinking of the relationship of these so-called labor saving devices to the entire work that is to be done in the kitchen. A refrigerator has its value, but unless it is well placed in relation to other equipment in the kitchen, it may greatly increase labor, rather than making the work of the homemaker easier. And so it is with all the other equipment.

I hope that some day a building concern may see the value of advertising a scientifically arranged kitchen, which actually *is* scientifically arranged, rather than featuring in their advertisements one or two bits of equipment which they feel will be of interest to the housekeeper. Unfortunately, the average housekeeper responds to that kind of bait—she wants the one bit of equipment which is expensive. And too often she rents or buys the house simply to get it. She is not a good buyer of a kitchen; she needs help.

It is considered to be good merchandising practice,

I believe, to educate the buyer to appreciate the value he is to receive. I hope therefore that we shall see more of this type of educational work in our new building developments. Let the builder cooperate with homemakers in training them not only to appreciate values when they see them, but in planning how to use them.

If the kitchen in a new house cannot be completely equipped by the builder, why cannot new projects provide suggestive floor plans which would guide the new homemaker in the placement of the equipment within her kitchen? These plans should be carefully drawn by the builder who has thought through the work of the kitchen as he plans it. This should prove a valuable merchandising factor, and should be extremely helpful to women in the use of their kitchens.

Is it too much to hope that in future every home building project may have associated with it an expert whose business it is to study the work of the home—not only in its relationship to the work of the kitchen but to the social and economic life of that family, as well?

If we could have a closer tieup between the study of the functioning of family life and the planning of homes for families to live in, I believe much would be accomplished toward a more adequate type of housing.

ABOLISHING THE DOMESTIC LOCKSTEP— THE SCIENTIFIC KITCHEN

ALICE L. EDWARDS

Executive Secretary of the American Home Economics Association, Washington

I very heartily agree with Miss Kneeland that the kitchen should be improved and that architects should incorporate in their plans, so far as possible, changes in keeping with the results of the study and research of home management specialists.

There are many different points which need to be considered in building the efficient kitchen. An illustration seldom considered is in the provision of "toe space" under the working counters in the kitchen. It very definitely relieves the strain on the back muscles as one stands and works at the counter. Recalling the effort required in one instance to secure "toe space" under the working counter in a kitchen, makes me realize that it is not always easy to secure what we want. And unless the plans and specifications for a house call for the desired features, our endeavors are usually fruitless.

As we list the desirable features, we find that about some we have a great deal of knowledge and rather definite notions as to what should be. For instance, when we speak of lighting we can readily recognize that both natural and artificial light should be provided for, and that there should be lighting which will afford adequate illumination for places where one is going to work.

When we speak about the size of the kitchen, it is evident from the statements already made that all kitchens should not be the same size. The use to which the kitchen is to be put is not the same in all houses, or apartments. We have a very different situation in the city apartment, for example, from that in the kitchen in the country; where more material must be stored, where more work is done, and where less ready-prepared food is used.

We know, too, that we cannot think of the kitchen apart from the rest of the house. For instance, the storage space outside of the kitchen should be easy to reach; and, of course, the kitchen and dining room should be closely connected. But the distance between the kitchen, the front door, and the telephone are also important, if the homemaker is to do her own housework. Consideration should be given to the important question of whether the housekeeping is going to be done by the homemaker or by hired help. And in almost all of our homes the homemaker does practically all of the work; only a very small part of it is done by some one else. She has more help probably from the children or other members of the family than from other sources.

I have had personal experience with four home management houses in which college juniors or seniors have done home management work. The largest of these houses accommodated more than twenty persons. It had a small excellently planned kitchen and pantry. The second house accommodated a smaller number, but the kitchen was very large and poorly planned. The third house was small and had a small well planned kitchen. The fourth was an apartment close under the roof with the light entering at a low level in the room.

It has been interesting to compare the reactions of the 12 or 15 groups of college students that I have known, that have lived in these different houses. In the case of the poorly lighted house or "attic" apartment, there was not the satisfaction and pleasure in doing the work that there should have been. In the case of the large poorly planned kitchen, there was a great deal of dissatisfaction on the part of the students, and the standard of work was much lower than in any of the other groups. The groups working in the two well planned kitchens took distinct satisfaction in their work, they were interested in seeing how quickly and how well they could do it, and the standard of their work was very much higher than in the other houses.

It is not unreasonable to suppose that the girls who worked in these two well planned kitchens will have a different attitude towards homemaking from the girls who worked in the poorly planned kitchens. Doubtless in innumerable instances the attitude of women and girls toward home life is greatly influenced by the conditions in the kitchen in which they must do their work. Considered in this light the well-planned kitchen has a distinct social significance.

One hears considerable discussion as to whether people are going to stay in or go out for their meals. A certain family lived in an apartment house where the kitchen wall was a dull unattractive color, causing the room to be very dark. The family ate more than half its meals out. When they moved into another apartment in the same house, but where the kitchen was painted a much lighter and more agreeable color and there was more light, they stopped, almost altogether, going out for meals.

There is no indication that the farmer's wife will be released from the preparation of meals. In the country meals will doubtless be served in the home for many years to come. Even if kitchen improvement is not so important to the city dwellers, we will not be wasting our efforts if we give time and attention to the improvement of kitchens for the country home.

Greater consideration in kitchen planning should be given to the judgment and suggestions of the trained women, who not only have had experience in doing practical house work themselves, but who have observed and supervised the work of other people. In planning houses we would urge that the point of view of experienced, intelligent homemakers be given careful consideration.

HOMES EQUIPPED FOR CHILDREN

MRS. LEON STERN

Author

About fifteen years ago I was addressing a woman's club in Galveston and was asked to talk on housing in New York City—not because I was a housing expert, but because I had been a social worker there. I told them a story of a youngster in one of the schools who had drawn a picture and whose teacher said, "Awfully well done. Now take it home and pin it up on your wall." The little girl queried: "Pin it on my wall? I can't do that, teacher, they won't let me." The teacher returned, "Of course they will, dear, tell your mother it's awfully well done, tell her to take a pin and pin it up." But the child insisted. "My mother has nothing to do with it, *they* won't let me. We live in the middle of the room and the other four families live in the corners, we don't have the walls."

It is not of that type of child nor of that type of home that we are speaking this morning. Every third child, I suppose, lives in a slum house. The lucky children are yours and mine. To those children it would seem that we owe what Dr. Ford has told you of—serenity, security, and beauty.

Sometime ago a woman writing in one of the magazines said that the modern child has not one very priceless thing which we, their elders, do have—they do not have a "house of memory" to carry with them as they grow older.

In one of his recent books Stephen Leacock describes exactly the type of person who would not have for his children a house of memory to carry into older years—the man who moves on September first into one apartment, and on the next September into another, and the following year into still another. Every child deserves, as Dr. Ford has said, a home, a separate home with his own folks, a permanent home in which to grow up, and about which its life will grow. Every child deserves the fine reality of security—the feeling that this is *my* place, that wherever I go I can return here; that this house remains and these doors will open for me.

Every child deserves also beauty in its home, light and color in abundance.

One of the speakers preceding me spoke with feeling and justice of the need for better kitchens for women in the home. At a recent Conference of the New York Federation of Women's Clubs, there was read a paper from a farm-woman in Canada. She had no idea she would win a prize, though it happens that she did. She described the kitchen she has—huge, dark, cluttered, dreary, where every day of her life is a bleak and pitiless drudgery. Again and again, her letter repeated this wish—"I wish I had sunlight, and yellow and blue colors—yellow and blue tables and chairs, curtains of checked blue and yellow, woodwork bordered in blue." In other words, she hungered for the sun and the sky. She did not know what she was unconsciously expressing.

The huge farm kitchen has gone; the little city-kitchen has come.

For myself, I am not quite certain that the very little kitchen is the one I would want for the children in the

average home. Your children and mine do not live in slum tenements, nor in bare farm communities.

Miss Kneeland has pointed out to us that the tendency today is for the modern housewife to have her family put on their hats and coats, betake themselves to a restaurant, and there have the family-meal. In other words, the housewife is inclined to say, "Let the restaurant keeper and the delicatessen keeper do my traditional job for me." Please don't think that I believe it ought to be her traditional job. But it has been.

The tendency today has been for the intelligent mother in the not too wealthy home, to shift more and more of her job to the delicatessen store, to the restaurant. Likewise, the playground, the school, the kindergarten, have taken the traditional, hour-by-hour, day-long job, of caring for the child in the home from the mother.

If my job were that of taking care of my house, if I were one of the 26 million housewives in the United States who besides bringing up their children today must do their own cooking, cleaning, ironing, most of my daily work would be, as is theirs, centered in the kitchen. The children to be with me, would have to be with me in my kitchen while I did the other part of my daily job—the housework.

I would want a large and sunny kitchen, which would be in part—as the oldtime farm kitchens at their best were—a playroom for my children. I would want them to have a corner there with bookcases that Dr. Ford talked of—low and accessible. I would want sunlight and color such as that Canadian farm-woman dreamed of. I'd want deep windows so that the outdoors could

be part of the daily job. It seems to me that the tendency toward smaller kitchens is impractical, so long as women do have the daily care of their children, and do have to do their housework at the same time.

One thing above all we should do. We should make the children feel it is their home and not only ours. I believe in everything modern women want and have done; nevertheless the important person in this world is not the woman, but the child. This is principally the century of the child. The important person in the home is not the adult; nor even the wife, but the child. Our time is past; theirs is coming.

It is for us to give the child everything the home has to offer so that in every way the gifts of every child in our homes will be developed toward happiness and a serene and wholesome approach to the future.

HOMES EQUIPPED FOR CHILDREN

BENJAMIN H. RITTER

Executive Secretary, Pennsylvania Housing and Town Planning Association

One of the most interesting things about this Conference has been the revelation of new plans for laying out lots and streets and new methods of construction which will make the home a better and safer place in which to live.

We have been told how the "obsolete back yards" may be abandoned for larger and better planned front yards—how houses may have two fronts and no back. This is a hopeful indication that some of us are going to live at home, where attention may still be given to family life—including the children. I hope we don't all acquire the habit of dining out.

In building for the Motor Age, emphasis was placed on street lay-outs that will secure safety for children. Open spaces and recreation facilities are to be provided in the immediate community as a means of promoting health and proper development of the child.

Dr. Ford has taken us a step farther and has enumerated those essentials which a well-ordered home should have, if it is to serve as a training center and proper environment for the child. I am sure we all agree with him that our homes should have no lower standards than those required for schools or settlement houses. If proper light, air and ventilation are so important in these public places, surely they are just as important

to have at home, where the infant child spends practically all its time, and where some of us spend some of the time.

A place to play—outdoors as well as indoors—is mentioned as one of the first considerations, and possibly it ranks in importance with a private bedroom and individual equipment designed especially for the child.

We are told that children properly sun-bathed, need neither cod liver oil nor irradiated food; and I am sure that we agree with Dr. Ford, that a modern quartz window pane instead of a bottle of fish oil is much more practical and desirable in the everyday life of the child.

As housing people I submit that it is our duty to place before the public those features of a home that will develop the child properly rather than those things necessary to correct physical defects or erroneous habits of living that should never have been formed. We know that the human being is still an outdoor animal even though his environment has been undergoing many changes in recent years. If yards and attics and sun parlors properly glazed are essential to child life in its adjustment to this environment, we should not lend our approval to any homes for children without such equipment.

IS GOVERNMENT AID NECESSARY IN HOUSE FINANCING?

GEORGE GOVE

Secretary, State Board of Housing, New York

Mrs. Wood maintains that there are forms of state-aid that are not subsidy which are essential to the solution of the housing problem. She postulates this upon a division of the population of the United States into three income groups, equally divided. The upper group have incomes of \$2000 a year and upwards; the middle group range from incomes of \$1200 to \$2000; and the lower group have incomes of less than \$1200 a year. I think that in any discussion of housing we begin there.

There are two kinds of people interested in housing; those who want to begin at the bottom, and those who are content to begin where private enterprise leaves off and do what can be done to bring new housing into the field not adequately taken care of by private enterprise. I am one of the second group.

Two and a half years ago, in 1926, the New York legislature enacted a state housing law. It was not designed to do the impossible. Those who sponsored the law knew exactly what they wanted to do. To a certain extent that law has been successful. It was not the law its sponsors asked for; one never gets that.

The New York law sets up a sort of partnership between a private corporation and the State. The private

corporation, on the one hand, must forego speculative profits, must limit its dividends, must effect every economy in construction and maintenance, must submit to continued supervision by the State Board of Housing and cannot sell its buildings for at least 20 years.

In return, the State offers tax exemption to the corporation on its bonds and stock. It permits municipalities to exempt the buildings from local taxation but not the land; and New York City has done this for a period of 20 years.

The law also sets up a scheme by which certain economies are obtained in financing the buildings. Loaning institutions are ready to lend on first mortgages at 5% to corporations approved by the Board, to the extent of two-thirds of the total cost. In other ways economies are sought and obtained.

The object of the New York law was to bring new housing within the economic reach of wage earners' families. It was not tied up to any definite scheme of Slum Clearance. Nevertheless, I believe that this law will be judged largely on its ability to accomplish something in the way of Slum Clearance.

The State Board of Housing has made intensive studies of land values in the congested areas and drawn up large schemes which involve street widening and relocation of streets, as well as certain economies that can be gained by scrapping old utilities and installing new ones. These schemes as worked out involve the expenditure of millions of dollars. The Board may be right or it may be wrong, but it does not believe that there is anything to be gained from a small job of Slum Clearance. I do not expect, however, that extensive

Slum Clearance is likely to be done immediately. There are too many problems at present confronting us, and the law under which we work is too weak.

It may be asked, "What has the State Housing Board done in the last two and a half years?" The Housing Law has been effective only since June, 1927, when New York City granted tax exemption to buildings constructed under its terms. In the 18 months since that time, 5 projects have been approved by the Board. Three (3) of these projects are completed and occupied, and the remaining 2 will be ready for occupancy in the Spring. These housing projects aggregate in value about \$5,000,000 and house a population of more than 5,000 people. Two are Slum Clearance operations. Two are co-operative.

The first, organized by the Amalgamated Clothing Workers of America, houses 303 families. In my judgment it is one of the best examples of model housing for wage earners in the United States. This is a co-operative enterprise and the rental cost to the tenant-owner is \$11 per room per month. The tenants will eventually own the whole project.

The second was built by the Farband Housing Corporation, a limited-dividend company sponsored by the Jewish National Workers Alliance of America. With the approval of the Board, this corporation constructed 2 building units, 6 stories high, of brick and steel construction, containing 504 rooms which rent at \$11 a room a month. Like the Amalgamated dwellings, the Farband project is co-operatively owned and operated.

The third project, now under construction in Brooklyn, will house 164 families, at rentals ranging from \$9 to \$11.30 per room per month. A fourth project has

been started in the Navy Yard section of Brooklyn, on a site now occupied by old, insanitary dwellings no longer fit for human habitation. This project will contain 376 rooms, renting for about \$10 per room per month. A fifth project is now under construction on the site of the birthplace of former Governor Alfred E. Smith, on the lower East side of Manhattan.

The Amalgamated Clothing Union, following its success in the first operation, is now building a new project on an adjacent site. When the new buildings are completed, the Amalgamated project will house 2,500 people under conditions that I have described.

Several applications for new projects are before the Board for approval, including plans for a large operation covering more than one square block on the lower East Side, for which the site has already been acquired.

What are the economies that result under this plan? The average rate paid for money in a commercial operation in New York City is around 9%. Under the Housing Law the rate is 5%. The reduction of 1% in interest charges on such a project means a rental reduction of approximately \$1 per room per month. The saving in interest charges to each tenant is therefore approximately \$4 per room per month. Tax exemption saves another \$2 per room per month. By avoiding certain fees and other charges in connection with organization and financing, 1% more is saved. As the result of lower amortization charges there is a saving of an additional 1%. The minimum savings, therefore, aggregate \$8 per room per month over rents in the ordinary commercial enterprise. However, I doubt if anywhere in the City of New York one can find for \$19 per room per month housing comparable to the Amal-

gamated dwellings. In fact, in another apartment house only a few blocks from these buildings, rentals on the first floor are \$30 per room per month, although the rooms are smaller and the house not so good.

The most significant feature of the State Housing law lies in the fact that it helps people to help themselves. It has enabled wage-earning families to lift themselves out of the worst tenements in New York City into the best type of modern dwelling, where they are surrounded by parks, playgrounds and open spaces.

Moreover, the law has made home ownership possible for families that heretofore could never hope for decent housing even on a rental basis. The average wage of Amalgamated clothing workers is \$35 a week, or about \$1800 a year. These families are well within the middle income group, which, as Mrs. Wood has said, commercial enterprise cannot serve. Nevertheless, by the exercise of thrift, they are actually acquiring ownership of their new homes.

IS GOVERNMENT AID NECESSARY IN HOUSE FINANCING?

JOHN J. MURPHY

Former Tenement House Commissioner of New York City

The point that is up for discussion, as I understand it, is How far Government is justified in constructing or subsidizing buildings, the rental of which is to be based—not on the cost of construction, but upon the needs of the people who are to live in them? in other words, whether rentals are to be determined largely by the limited income of the occupants.

In the city of New York during the last few years the suggestion has been made quite frequently that, in view of the admittedly deleterious effect of bad housing, the City would be justified in entirely disregarding cost of construction, and renting apartments on the basis of what the tenants can afford to pay.

I suppose there is something interesting in a young man's being regarded as old-fashioned; but for an old man to be so regarded is rather intolerable. Nevertheless I confess to being old-fashioned. I was reared under a dispensation which held the view that the People were to support the Government rather than that the Government was to support the People. Clearly, a municipal contribution to the cost of erection of buildings—and it would never be a low cost under government construction and management—is a contribution to the tenants' living expenses, as much as if their food and clothing were provided. It is merely camouflaged

outdoor-relief. We recognize that under certain conditions such aid must be provided; but it ought to be clearly recognized for what it is—a direct contribution to the maintenance of people who are unable to support themselves.

And what a reflection upon American social conditions! We have evidently a great mass of people whose wages have not risen enough to offset the fall in the value of the dollar, and who, therefore, are unable to pay the rentals necessarily required by the ordinary cost of construction.

We talk about government-aid. I wonder whether anybody has ever thought of the part that government obstruction of trade plays in this matter. It is hardly too much to say that 25% of the cost of constructing houses in the United States, today, is directly due to the obstructive action of the government. We have a system which keeps out anything in the nature of foreign competition and, consequently, raises the cost of the materials that go into houses. Three or four years ago freight rates were made by the Interstate Commerce Commission which, it was stated, added \$250 to the cost of every single-family house that might thereafter be erected.

Can there be any doubt that the government policy of restricting immigration has added enormously to the cost of building? When this question of government-aid to housing is considered, I hope that government obstruction to housing will be taken up, to see whether some of that can not be removed. If that were removed how far it would go to make unnecessary this thing which I abominate—government-aid to presumably and normally solvent people?

Have we got to a point in the United States where we are on a parity with labor conditions in Europe? Have we here large numbers of men and women working at what is apparently necessary labor—and yet not able to get enough pay for it to enable them to live and support themselves, and pay a fair rent for the housing accommodations which they must have?

For my part, I would prefer to see the working man able to stand on his own feet and pay his own bills—than to see him look to government for those necessary things which an unjust social order makes it impossible for him to secure, without resort to mendicancy.

BUILDING AND LOAN ASSOCIATIONS AS HOME FINANCING AGENCIES

JAMES S. TAYLOR

*Acting Chief, Division of Building and Housing, United States Department of
Commerce*

Major Bliss has given a fine account of the good work being done by Building and Loan Associations and has indicated the magnitude and importance of that work.

It is my purpose to take up some of the problems that lie just beyond the field now covered by Building and Loan Associations and similar institutions, and which need to be solved if we are to consider our system of home financing as wholly satisfactory.

If I am not to be misunderstood, I must point out that not all organizations entitled "Building and Loan," or its equivalent, are equally worthy of the name which has been made to mean so much by the good work of the very great majority. Furthermore, the scope and functions of Building and Loan Associations—and of savings banks, many of which perform equivalent functions—vary greatly in different sections of the country; where the conditions under which they operate are very different. Some Philadelphians, for example, think of Building and Loan Associations as specializing in second mortgages. In other places the taking of second mortgages by Building and Loan Associations is regarded as, not only outside the proper field of an Association, but beyond the pale of the law.

Geographically, we find these organizations relatively weak in some sections, and frequently handicapped in achieving their purposes by inadequate or ill adapted state regulation and examination. The United States League of Local Building and Loan Associations, the Building Savings & Loan Institute and allied bodies are doing much splendid missionary work in this field of organization, and in the building up of standards where that is required.

In percentage of value loaned there are likewise great variations. Taking the country by and large, a great many homes are bought or built where the owner's legitimate needs for credit are not met by recognized financing agencies—transactions where the owners have to pay beyond reason for second mortgage financing. There are abundant capital resources in the United States, which would be available if we had the right machinery operating under the right conditions. There seem to be two main angles from which the problem may and should be attacked. One is through companies organized specifically to handle second mortgages or land contracts, with economical methods of doing business and reasonable charges; the other is through extending the percentage lent by first mortgage institutions.

The task confronting us is to find out what can and is being done to help bring relief along these lines. Greater stabilization of home property values is one factor, and I believe that better city planning, better platting of residential areas, and the zoning ordinances in effect in cities embracing three-fifths of the urban population of the country are doing much in this direction. Vacancy surveys showing types of dwellings un-

occupied, and building under way, are helping in various cities where they are regularly undertaken.

Better determination of standards of value in construction, and education of the public to appreciate them represents another good tendency which can be accelerated. A start in the right direction has been made by a number of organized groups. It seems significant in this connection that in Philadelphia—where so many of the houses can be classified into well defined or standard types—second mortgages which, with the prior obligations, involve up to as much as 80 or 90% of the value, are handled extensively by Building and Loan Associations without serious record of losses. In Baltimore, where there are also recognized standard types of houses, Building and Loan Associations take mortgages which are secondary to ground-rent obligations.

I am not in any sense arguing for rows of houses all of one design, but pointing out that the value of houses, designed and built according to known standards of quality, is more readily subject to close determination; and that houses of uniformly good standards built throughout a neighborhood tend to stabilize values there.

Another requisite is more scientific appraisals of property. It would be of help if it were the universal rule that they be made in the first instance with only property considerations in mind and with separate allowances, if need be, for determining the amount to be loaned according to the relative scarcity or abundance of loanable funds in relation to demand, or on account of unusual personal factors.

Better standards relating to personal risks also need

to be evolved and given recognition. Experienced lenders acquire ability in appraising moral risks, but all too seldom does a home buyer who is a good moral risk get much benefit from that fact when it comes to a present-day transaction involving the commercial discounting of a second mortgage note.

A young man who has worked his way through college, has had to borrow to help do it, has paid off his debt, and helped to support dependent relatives after marriage, has given abundant evidence of ability to live on less than he earns. Should he not be recognized as a better risk—even if his savings are small—than the man whose personal expenses have kept him on the ragged edge or in debt for years, but who has acquired money for the first payment on a house through a legacy or gift?

And how about earning prospects? I believe that extended and careful analysis of financial histories of families applying for home loans would permit much more scientific appraisal of personal risk factors.

Legal limitations stand in the way of extending the percentage loaned by first mortgage institutions in a number of states—sometimes with no extra allowance for amortized loans.

We must undoubtedly look to second mortgage companies to cover a part of the field. Lack of established contact between them and first mortgage lenders appears to result in multiplication of expense in connection with handling loans, through the real or assumed need for separate title examination, checking up on insurance, and so on. How contacts may be established so as to lessen expenses is a problem deserving of study.

It is my belief that the men who are best acquainted from experience with the home financing needs of their communities are in the best position to contribute, personally, in this and in other ways toward better organization of facilities in the second mortgage field. The American Bankers' Association Journal has suggested the field as a proper one for financing companies affiliated with banks. Builders, building material dealers, and many other business men, and civic groups, also, have recognized their direct interests in the problem.

Much else remains to be done. Improvements in organization and practice, which might be made possible through revision of state usury laws, deserve study and consideration.

The cost of second mortgage financing, both to the borrower and to the lender, might be dealt with more frankly to the benefit of all concerned. Is not the borrower entitled to a statement of how much he has to pay for the money he borrows—and why? Yet, we in the Department of Commerce had to prepare a table especially for "Present Home Financing Methods" to show how interest could be ascertained on a discounted, equal monthly payment, amortized loan. Although this is the commonest variety, we could find no easily used table available. Study of tables like this—which show actual rates of 20 to 30% interest a year on outstanding balances on second mortgages as not uncommon, where second mortgage facilities are inadequate—might also be used to help encourage savings.

I cannot close without again referring to the vast, efficient, and progressive service which Building and Loan, and kindred institutions, are rendering in increasing volume to the American people—a service

which, I believe, will be reflected in the figures for home ownership from the national census to be taken next year. We expect to find that the trend of home ownership in the United States, which up to 1920 had been downward for many decades, has taken a turn in the right direction.

BUILDING AND LOAN ASSOCIATIONS AS HOME FINANCING AGENCIES

GEORGE W. CLIFFE

Secretary, Pennsylvania League of Building and Loan Associations

To quote an eminent authority, "The aim and purpose of a Building Association is to aid and encourage its members to learn and practice thrift by regular systematic savings; and to provide ways and means by which every family may procure a home."

In 1831 in Philadelphia the Oxford Provident Building Association was organized by a few working men who desired to plan some way to enable them to own their homes. With some modification, this idea is now in use in every state of the Union and the latest available statistics give a membership of over 11 million persons.

I wish to speak more particularly of Pennsylvania. There are 4400 of these organizations in the state; about three-fourths of them in Philadelphia.

The assets in Pennsylvania are over one and a quarter billion dollars. Last year they showed an increase in assets of 100 million dollars, with a total membership of 1,176,104. Each Association has at least 10 unpaid directors; so nearly 45,000 men are giving freely of their time for the furtherance of this wonderful movement. Expenses of management are kept at a very nominal figure. The average for the entire state being less than one-half of one per cent of the assets. The secretary and treasurer are usually the only salaried officers.

A Building Association charging a borrower 6% per annum for a loan will return to the shareholders a profit considerably in excess of that sum. The Associations are, because of their admittedly worthy objects, free from state and federal taxation.

Building Associations in Pennsylvania in the year 1927 assisted in the purchasing or building of 42,613 homes; statistics for 1928 are not yet available but will probably largely exceed that figure. If the average family consists of 4 persons, this gives 160,000 individuals each year provided with homes by this unequalled method. It is often possible for a purchaser to secure a home at a monthly outlay only slightly in advance of the rental value of the property.

If because of loss of employment or sickness, the borrower is unable to keep up his weekly or monthly payments, the Association will generally be able to tide the member over his difficulty and enable him to retain his home. Associations may be organized in very small communities and are successfully managed by men who have little or no financial training.

It may be well to emphasize the safety of Building and Loan Associations, especially as attention has been called to the fact that they are managed by men comparatively inexperienced in financial affairs.

In the year 1927—these being the latest available statistics—but 12 Building Associations in the United States failed. During the same period there were reported 689 failures of state and private banks and 135 national banks—no figures are available for trust companies.

As illustrative of the growth in recent years of the Building Association movement, in 1914 there were 634

mutual savings banks and 6,616 Building and Loan Associations; in 1927 the mutual savings banks were reduced in number to 618 and the Building and Loan Associations had increased to 12,900. The number of depositors in mutual savings banks in 1914 were 8,200,000, as compared with a membership of 3,100,000 in Building and Loan Associations. In 1927 the mutual savings banks had 11 million depositors and the Building Associations had the same number of members.

Referring once more to 1914, the mutual savings banks had practically 4 billion dollars in deposits and the assets of the Building Associations at the same time were 1 billion 3 hundred million; in 1927 the deposits of the mutual savings banks were slightly over 8 billion dollars and the assets of the Building and Loan Associations were over 7 billion dollars.

From which it is evident that, not only in Pennsylvania but all through the United States, these Associations are helping to solve the housing problem as no other institution has ever done.

THE COST OF DIRTY AIR—OR MONEY TO BURN

LAURA A. CAUBLE

Chairman, National Conference Board on Sanitation

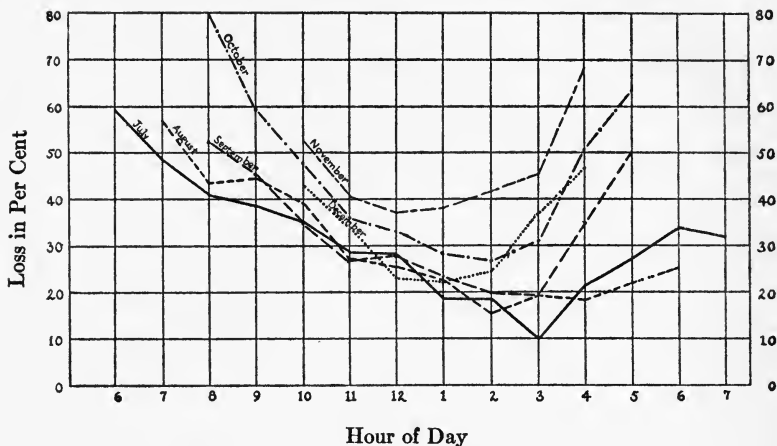
I want to add just a word or two from the human standpoint. All of the business in the world created by men and women is created for the making of the home in which a father, mother and children are to live. We must recognize the change in human values created by the smoke nuisance if we are to take a right attitude in the control of it. Sunlight is necessary for growth and health. Smoke cheats all of us of the necessary sunlight.

For three years we have been measuring the waste in visible sunlight in the city of New York. I wish this could have been done simultaneously in many other cities, because the waste goes on in every smoky urban community. In the city of New York we first placed our daylight recorders on Hoffman's Island as the base line—the cleanest spot in the city; at a hospital at 67 Hudson Street; on an office building at 104 Fifth Avenue at 15th Street; and on the Roosevelt Hospital at 59th Street and 10th Avenue.

A curious thing developed as these records were analyzed. In placing a machine at 67 Hudson Street we supposed we were putting one in the dirtiest part of the city, yet the record of loss of sunlight from smoke was just as great at 15th Street on top of a 21-story building and about the same at Roosevelt Hospital. One hundred four Fifth Avenue is in a wide part of the city in which thousands of families live. The Roosevelt

Hospital region is residential and contains a group of hospitals and a high school in which 10,000 boys work daily. Later our base line was changed to the top of the Half Moon Hotel at Coney Island which is as clean as Hoffman's Island. The chart here represents a sum-

LOSS OF LIGHT IN PER CENT DURING THE LAST SIX MONTHS OF 1928



1928	Total Loss in %
July.....	27.5
August.....	28.5
September...	29.9
October.....	38.6
November....	45.5
December....	31.0

Note that as the year advances the days are shorter and the loss of light in the mornings increases.

mary of 6-months' record of each measuring of daylight. We found the lowest loss of sunlight in July, 27.5%; August 28.5%; September 29.9%; October 38.6%; November 45.5%; December 31%. During November the average illumination showed no sunlight recorded by our machines at 104 Fifth Avenue before

10 o'clock in the morning, and none later than 4 o'clock in the afternoon. The dense smoke completely shut out the natural light until 10 o'clock in the morning. We worked under artificial light most of the day.

What values are involved in this loss of sunlight? During the period at which school authorities urge mothers to put their children into the sunlight for play there wasn't any more reason, from the point of view of available ultra-violet light, for putting them there than there would have been for putting them in a closet. Ultra-violet light was practically lost in New York City. This is relatively true in other smoky cities.

This is important to us in dollars and cents. I am told by the Department of Education in New York—and I think it would be verifiable in a degree in other cities—that fully 300,000 children do not keep up with the grades. A large number are in outdoor classes. It costs twice as much money to educate a child in an outdoor class as it does in the regular class room. There is a monetary waste in outdoor class work under such conditions which is pretty definite. Under any natural condition of sunlight children should be out of doors between 11 and 2. It is suggested by private school teachers and head mistresses that it might be easily possible for them to place their children outdoors for the play period in the middle of the day, and have the working sessions of the school in the morning and later in the afternoon. This would be a more difficult adjustment in overcrowded city public schools.

What we need is a place in the sun for everyone. How can we get it? Control the smoke nuisance at its source by proper methods of firing and by the using of the right kind of fuel for each type of heating apparatus;

by proper ordinances and law enforcement, backed up by a constructive educational programme in the values involved in the waste of natural sunlight and in the need of sunlight for growth and sanitation. Herein lies a reasonable hope for the control of the smoke problem. I am not pessimistic about this. We have educated people in other problems, e. g. the control of the milk supply; the prevention of disease etc. This problem of the smoke nuisance and its control is primarily a problem of education, the evolution of our urban life and the manufacturing involved has developed the problem. It is entirely possible to control it by education.

The knowledge of the value of ultra-violet light will give an impetus to any programme you may organize. I am perfectly open-minded in my reception of any story of what ultra-violet light will do and will not do. I think we need to gather data from every source and put the facts in relation so that we may have a practical understanding of how we may use them. Until the smoke nuisance is controlled at its source there is no use to spend a cent of money in smoky cities for any so-called ultra-violet transmitting window glass. There is not enough ultra-violet light available to make it a paying investment. I do not know that I could add anything more to this discussion than to say that the country dweller, as far as the sunshine goes, has a decided advantage over the city dweller.

My final advice is, make a constructive plan of smoke control, see that the constituted authorities have power and funds sufficient to do a complete job, educate public opinion to the fact that a man who fills the air with smoke is as great a menace as the man who contaminates milk, and we may have a reasonable hope that each of us may find a place in the sun.

THE COST OF DIRTY AIR—OR MONEY TO BURN

FRANCIS E. FRONCZAK, M.D.

Health Commissioner of Buffalo

The time is coming when the smoke nuisance in our cities will be eliminated. In every Conference of this kind there are certain conditions which will be discussed—certain unnecessary conditions which must be removed—and I am very glad indeed that among the conditions which we are discussing at this meeting is the question of the elimination of smoke.

At the present time, the preventable conditions which the cities are especially interested in eliminating are unnecessary noise, pollution of the waters and pollution of the air. Unnecessary noises are a nuisance both to the sick and to the well; and without doubt create disease conditions. We pollute our potable waters and permit raw sewage and industrial waste to be emptied into our rivers and lakes, from which later we draw the same contaminated water, filter it at great expense, sterilize it and drink it—to the outrage of public decency.

For years it was said that this evil could not be eliminated; that the rivers and streams are the natural place where sewage and industrial waste must go. And yet, public opinion is slowly but surely forcing all enlightened communities to remove such a nuisance. All the large cities are now beginning to build sewage dis-

posal plants at a terrific expense in order to eliminate this danger to health, and stop outraging public decency.

The third of these preventable and unnecessary nuisances is smoke. We pollute the air—the air which we inhale at the rate of about eighteen times or so a minute in order to revivify our blood stream, in order to obtain the necessary oxygen. And in that air we inhale particles of coal, various kinds of gases, vapors of all kinds; and we believe that this polluted, contaminated air will do exactly what nature wanted the pure unpolluted air to do.

I do not care to speak on the cost of dirty air. I do not care to speak about how much of a loss it is to the community, to the merchant, to the individual; how much harm it does to the factory; how much money value actually goes to waste by the emission of these particles of coal; this manufactured energy which could be re-used—and, no doubt, will be re-used.

I am interested solely in the matter of public health. For 30 years I have devoted my life to preventive medicine; for 22 years I have been Health Officer of one of the large cities of this country, and I can see more and more that public opinion is slowly being educated to the fact that the smoke nuisance must be eliminated and shall be eliminated from our communities.

If we come into a city from the country at a distance, we see a cloud hanging over the city. We can always tell where the industrial centers are; and where cities are. It is the place where you see the permanent, eternal cloud of smoke through which the sun can hardly penetrate and the ultra-violet rays are in great part removed.

The closer we come to the city, our eyes begin to water from the gases floating in the air, from the particles of coal; we often begin to have spasmodic coughs—all due to the fact that through our chimneys of all kinds we permit these vapors, these particles of coal, these gases to be ejected. We know very well from experience that people living in communities where the atmosphere is constantly smoke-laden, suffer from irritation of the mucous membranes.

The question is “What can we do about it?” Everybody says nothing can be done; that the expense is too great; that people will tolerate not only present smoke conditions; but, on account of increased use of bituminous coal, that the smoke nuisance will become worse and worse.

There are several things that can be done. In the first place, the time is coming when every civilized community will demand that locomotives coming into a city shall not be continually polluting our air with smoke; that either some other system shall be developed by engineers—some new system; or a smokeless fuel found; or a new system of stoking discovered; or electricity or some other power used; which, in time, will eliminate smoke from this source and also eliminate the smoke that is belching from our factories.

Here again, in a great number of cases, the trouble is due to bad firing, to the improper use of coal, to the improper use of mechanical devices thus far invented. I am quite positive that even the mechanical devices for the elimination of smoke will be improved upon; and will, in a great degree, be able to reduce the present smoke pollution.

The greatest amount of our smoke nuisance, however,

is created by the homes themselves. In the average large city we have tens of thousands of homes—each one emitting smoke, each one creating this nuisance, each one a danger to his neighbor and a danger to itself. No doubt by education, by the use of proper devices, we can, in great measure, reduce the amount of smoke emitted from the chimneys of the homes.

Mr. Wyer says that electricity is too expensive to take care of all the heating and cooking in the home. He certainly can not believe that oil or gas will be able to take care of it. Apparently he does not believe that we will have central heating plants for certain blocks or districts; and he gives the reason for this. Perhaps the reason is good at the present time; but it is not so many years since the wick lamp was considered very good. Who at present wants to illuminate his home with a wick lamp or even a gas jet if he can use electricity?

Electricity has come to stay. Who knows but what some one will discover or invent something superior to electricity that will contribute to the elimination of the smoke nuisance?

I believe that a central heating plant, properly constructed, properly run, with proper fuel, by experienced firemen or engineers, will reduce in a great measure this nuisance that is so detrimental to health.

I, for one, cannot agree that smoke is bound to stay in our cities. On the contrary, I believe that smoke will be just as surely eliminated, as raw sewage is being eliminated, and as other nuisances are being eliminated—and that cities will be free and in some measure able to breathe in air more clear and more pure than it is today.

HEALTH VALUES IN ZONING

EDWARD T. DEVINE

Executive Officer, Bellevue-Yorkville Health Demonstration, N. Y. C.

I cannot think of any way in which I could have more profitably spent three days in preparing for the new public health work I am undertaking in New York than by attending this Housing Conference.

For, the health of the people does not depend mainly on what surgeons and doctors do in hospitals and at the bedside of the sick. It depends upon what architects and builders, public officials and house-keepers do in connection with the homes in which we live; and on what the financiers and managers of our industries do in the places where we work.

There is another big factor of course, namely, our personal habits. These depend very largely of course on our parents and our teachers.

What Mr. Heydecker said about the lack of any statistical correlation between communicable diseases and housing conditions is in line with what all representatives of the new public health programme have been telling us. We know now that the people who were saying so much in the early days about bad smells, and filth and dirt, and the need of dealing with them, because in that way we would reduce our death rate, were hardly warranted by the facts. We know now that the glue factory and the cannery give us about the worst smells that we have, but they are filled with people who live rather longer than other industrial workers.

We know now that you can have a great deal of very disagreeable filth without, on that account, having more typhoid or diphtheria or pneumonia or venereal disease or any other communicable disease at all.

We know now that if you want to control communicable disease, what you want to do is to find the human beings who have it and control them. And so, when you get an accurate scientific balanced statement like the one that has just been made to you, it does not mean that the dark rooms and the filth, the accumulations of rubbish and the other things that people used to denounce and say that we must clean up for health reasons, are not objectionable.

It only means that what we have to do is to get rid of them because they are indecent, because they are objectionable; because we are civilized.

It is true that our health is not fully measured by the death rate. It does include something positive, something affirmative, something that perhaps the word happiness better suggests, physical well-being living on the heights, living in such a way that we have some surplus energy left, even at the end of a hard day's work.

We shall make progress better, if we put our emphasis in connection with our housing work, and our zoning upon the argument that we are civilized; that we have higher standards: that there are positive, affirmative needs and wants; and that, in order to get them, we will have to cut out things that are indecent; things that are objectionable; that are inconsistent with the standards of civilized human beings.

This three day programme hangs together with a unity that is very remarkable. The Slum Clearance

discussion of the first day, the discussion of government-aid in housing, the discussion of the economy of the kitchen—all of the discussions we have had in here in these different programmes—have, to my mind, had this unifying, centralized thought that we need a new democratic type of social control; that we need to realize that our democracy is not—as perhaps our forefathers 150 years ago may have thought—something that will come of itself if you get rid of tyranny; nor that it is just a matter of removing external interferences with human freedom.

Of course, we want those removed. But we have gradually come to realize that democracy is more than that—that democracy means self-rule with standards. It is precisely in this field of housing, that, in the last quarter of a century, we have come nearer to working out objective standards that will be so applied that we can say, with some confidence, what is and what is not permissible in a self respecting, civilized community.

Like Dr. Fronczak, I was disappointed in what was said this afternoon on the Smoke Nuisance. I was impressed by the facts, but was disappointed when it came to the moral, that the man who is shovelling in the coal ought not to cover the fire, that Boulder Dam and Muscle Shoals are not very important; and, finally, that you cannot do anything with a Smoke Abatement ordinance, that you have got to wait until public opinion is developed.

I think that there is a great deal we can do about it. I think the most important part is education. I am not overfond of coercion. I would rather do things by education; but we learned long ago that there is a certain something that has to be done by coercion. You

have got to establish certain standards, not arbitrarily interfering, but just writing into the law what is necessary to do—the established standards that the people have already achieved.

A very large part of the human race are today under Bolshevistic dictatorship; another very large part are under Facist dictatorship, or some kind of dictatorship corresponding to that of Mussolini. I hate them both with every inherited principle of my Americanism. But, friends, in Russia and in Italy and in Spain and in other countries where they have established dictatorial control, they are only giving expression to a need of our times. They are doing it in undemocratic ways—in ways that go counter to every instinct of our inherited traditions of freedom and independence.

If I had to choose between arbitrary social control of a Bolshevik or Facist regime and an attitude of complete *laissez-faire*, which means commercial exploitation of the weakness of men, I am not at all sure that I would want to choose. We Americans have got to work out a plan of social control that is consistent with our inherited conception of freedom—a system that is democratic. We have not yet done it.

We have got to do it with reference to some things. We have got to do it with reference to smoke; we have got to do it with reference to the windows we will allow in a house.

The crystallization of the higher standards of our time, and the enforcement of those standards against people who are trying to make money—or who through sheer inertia and indifference, are unwilling to accept the standards of their times—may seem to many people like interfering with individual liberty.

HEALTH AND ZONING

GEORGE J. NELBACH

Exec. Secy., State Committee, Tuberculosis and Public Health, New York

Zoning means the division of municipalities into districts, and the imposing on private property in such districts of uniform building restrictions relating to height, bulk and use.

Health means something more than the mere absence of disease. It is a positive quality. It has to do with the mind as well as the body.

The late Geo. C. Whipple, Professor of Sanitary Engineering at Harvard University, has defined health as "that state or quality of life in which the body is sound, the various organs function naturally, and the whole organism responds adequately to its environment."

It is recognized that some factors tend to injure normal health or to lower its status, whereas other factors tend to promote it or raise its status above the normal. Normal health pre-supposes a normal environment.

The aim of zoning is—among other things—to secure and maintain an environment in which normal human beings can lead normally healthful lives.

INDOOR AND OUTDOOR CONDITIONS

The relation between health and indoor life has long been recognized by the courts. For many years there have been laws and ordinances covering the size and

ventilation of sleeping rooms, drainage, dark hallways, cellars, windows, refuse disposal and many other items.

Now-a-days, it is coming to be recognized more and more that indoor conditions are dependent on and are controlled by outdoor environment. The light that enters a room through a window depends upon the light that falls on the wall outside of the building, which, in turn, is affected by the position, height and bulk of neighboring buildings.

The *quantity* of air that enters a building is influenced by neighboring buildings, and its *quality* is affected by what is going on in the neighborhood.

Conversely, the indoor use of property may affect outdoor conditions. Buildings of great height and bulk lead to such indoor massing of people that health—along with safety and morals—may be jeopardized.

The indoor use of property, whether for residential, business or industrial purposes, controls the character of the outside traffic, and the character of the pavements required for it. Accordingly, indoor use of the property affects the cleanliness of the street, as well as dust, smoke, odors, noises and the rest.

AIR

Any air that, because of dust, bacteria, irritating fumes or offensive odors, tends to induce shallow breathing must be regarded as injurious to health.

Just as pure air tends to promote health by inducing deep breathing and stimulating the bodily functions, so exposure to vitiated air tends to break down the resistance of the individual to disease—especially to cold, pneumonia and tuberculosis.

The air which enters a building both in quality and

quantity is influenced by the neighboring buildings and by the streets.

In the interest of air purity, zoning is justified. Residential districts where people sleep and spend their leisure and where children grow up need protection against the atmospheric dirt, smoke, fumes and odors of the business and industrial districts.

SUNLIGHT AND DAYLIGHT

Sunlight has a vital bearing on the matter of health—its reaction is both physiological and psychological. It is a natural stimulant to the skin and nervous system. It helps to build up resistance of the body against diseases like tuberculosis. It plays an important part in the cure and prevention of rickets in children. It helps to cure tuberculosis of the bones and joints. It provides illumination, the absence of which hinders activities of mind and body and induces eye strain with attendant damage and discomfort. It is a powerful disinfectant, rapidly destroying bacteria exposed to it.

Daylight does all these things but to a less degree than sunlight.

Adequate provision for allowing sunlight and daylight to enter inhabited buildings is essential to human growth, health, vitality and comfort.

Whoever by building over much on his own land prevents his neighbor from receiving a reasonable amount of light on his land is doing an injury which properly comes within the scope of police power.

CONGESTION

One of the most important reasons for restricting the height and bulk of buildings is to prevent overcrowding of corridors, elevators, streets and sidewalks.

When people are brought into crowded elevators and cars, or sidewalks there is greater opportunity for the transmission of communicable diseases, particularly through the throat and nasal sprays containing disease germs.

NOISE

Noises hinder sleep. Certain persons—especially those suffering from nervous diseases—are seriously injured by noise and vibration. Noises interfere with the comfort and tranquility of life. Many kinds of noises are apparently inseparable from business, traffic, and manufacturing processes. Segregation through zoning regulations appear to be the best solution.

TO SUM UP

The relation between zoning and health is a mass relation. It is the health of the community, the collective health of many people that is at stake. Families rightfully separate working quarters from sleeping quarters. Cooking, eating and sleeping in the same room is regarded as insanitary. Tenement house laws, factory regulations, building codes and the like safeguard the internal uses of buildings.

Zoning does for a city as a whole what some of these laws do for the factories, school houses and dwellings.

DELEGATES



DELEGATES

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